

80000 SERIES
10% P.C.W.
RECYCLED

MATERIAL SAFETY DATA SHEET

Date: 10/30/95

Nos. 4776, 5520, 4777, 7793
7794, 1698, 5610, 7282

A. P. GREEN INDUSTRIES, INC.
GREEN BOULEVARD, MEXICO, MO 65265
EMERGENCY TELEPHONE NUMBER — 314-473-3626

SECTION I

PRODUCT NAME:	DV	BRICK MIX 1009	GREENAL-80-AR***
	DV-38	R-6005	GREENAL-83-MP
	DV-38 AH	GREEN 5B81	GREENAL-85
	DV-38 P	GREEN 5B84	

PRODUCT TYPE: Refractory Bricks or Shapes

CHEMICAL FAMILY:	SiO ₂ = 8-12%	Al ₂ O ₃ = 78-86%	FORMULA: Not Applicable
	Fe ₂ O ₃ = 1-2%	NaKO = 0.1-0.4%	

SECTION II

PRODUCT HAZARDOUS INGREDIENTS

<u>CHEMICAL</u>	<u>TLV-TWA</u>	<u>CAS #</u>
Cristobalite (SiO ₂)* (5-12%)	0.05 mg/m ³ ** Respirable Dust	14464-46-1
Quartz (SiO ₂)* (0-2%)	0.1 mg/m ³ ** Respirable Dust	14808-60-7

* Not mechanically separate from each other or other mineralogical phases in product as supplied.

** Source: American Conference of Governmental Industrial Hygienists, 1994-1995.

*** This product contains a barium compound, which is reportable under Section 313 of Title III of SARA and 40 CFR Part 372. For purposes of reporting environmental discharge, use 3% barium content.

SECTION III

HAZARDS INFORMATION

This product contains crystalline silica. Prolonged exposure to dust may cause silicosis, a progressive pneumoconiosis, or other respiratory diseases. International Agency for Research on Cancer (IARC) has classified crystalline silica as a Class 2A carcinogen. Their study concluded that sufficient evidence for carcinogenicity exists in experimental animals and that limited evidence for carcinogenicity exists in humans.

Dust from product at any stage of its use or during tear-out after service may, especially on long exposure, lead to lung disease unless respiratory protection is employed. NIOSH approved respirators should be worn any time that refractories are torn out after service. While a respiratory hazard and/or nuisance dust may exist from the product itself, other foreign substances may warrant additional precautions during tearout and disposal.

SECTION IV
FIRST AID MEASURES

EFFECT OF OVEREXPOSURE:

EYES: ACUTE: Dust or chips can cause mechanical irritation.
CHRONIC: None Known

SKIN: ACUTE: Can cause mechanical abrasion or cuts.
CHRONIC: None Known

INHALATION: ACUTE: Dust, if present, may cause upper respiratory irritation.
CHRONIC: Long-term exposure to dust may cause lung damage.

INGESTION: ACUTE: Unknown
CHRONIC: Unknown

FIRST AID MEASURES:

EYES: Flush with clean water for 15 minutes. If irritation occurs, consult physician.

SKIN: Wash with soap and water. If irritation occurs, consult physician.

INHALATION: Remove to fresh air. Seek medical attention.

INGESTION: Contact physician immediately. Do not induce vomiting unless instructed to do so by physician. Product is non-toxic as supplied, but its abrasive nature could damage internal organs.

SECTION V
FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES: None

EXTINGUISHING MEDIA: Not Combustible

FIRE FIGHTING INSTRUCTIONS: No special instructions.

SECTION VI
ACCIDENTAL RELEASE MEASURES

SMALL/LARGE SPILL: For broken shapes or fragments, sweep, shovel up, or pick up and place in a container for disposal.

SECTION VII
HANDLING AND STORAGE

Store in a dry place, away from extreme heat. Product is non-flammable.

SECTION VIII
EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General mechanical ventilation is usually adequate (see SECTION II).

RESPIRATORY PROTECTION: Use a NIOSH approved respirator when working around dried material and when removing this product after service.

EYE PROTECTION: Goggles or safety glasses with side shields should be worn.

SKIN PROTECTION: Wear impervious gloves and long-sleeved and long-legged clothing should be worn to prevent skin contact.

OTHER: Safety shoes should be worn to prevent foot injury from accidentally dropped bricks or shapes.

Wash clothing separately and rinse washing machine afterwards.

SECTION IX **PHYSICAL AND CHEMICAL PROPERTIES**

APPEARANCE:	Buff solid		
BOILING POINT:	Not Applicable	pH:	7
SOLUBILITY IN WATER:	None	ODOR:	None
SPECIFIC GRAVITY:	3.0-3.2	MELTING POINT:	Not Applicable

SECTION X **STABILITY AND REACTIVITY**

Product is stable under normal conditions of use, storage, and transportation.

Product can react with concentrated acids.

SECTION XI **TOXICOLOGICAL INFORMATION**

LD₅₀ or LC₅₀ for oral, dermal, or inhalation routes of administration: no data for product.

SECTION XII **ECOLOGICAL INFORMATION**

Ecotoxicological/chemical fate information: not available.

SECTION XIII **DISPOSAL CONSIDERATIONS**

As supplied, product may be disposed of in an approved landfill, in accordance with federal, state, and local regulations.

Supplier can make no statement concerning disposal of used product, since product may become contaminated by hazardous materials during use.

SECTION XIV **TRANSPORT INFORMATION**

U.S.A. DOT:	Not Regulated
Canadian TDG Hazard Class & PIN:	Not Regulated

SECTION XV
REGULATORY INFORMATION

TSCA Status: All Components Listed

Canadian DSL: All Components Listed

SARA Title III, Section 313: This MSDS provides the toxic chemical "SUPPLIER INFORMATION" required under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR 372. Toxic chemical information, if applicable to the product(s) named, is located in **Section II - HAZARDOUS INGREDIENTS** section of the MSDS. This information is subject to the toxic chemical reporting requirements of Section 313 and must be included in all MSDSs that are copied and distributed for this product.

SECTION XVI
OTHER INFORMATION

MSDS Status: New format, new MSDS for GREEN 5B81 and GREEN 5B84, replaces MSDS Dated 02/15/95 for other products.

Note: This material safety data sheet contains confidential proprietary information and is not to be disclosed to the general public or to competition except as required by law. The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with A. P. Green Industries, Inc. or not. This information is offered solely for use in your evaluation of this product in respect to safety, health, and environmental hazards.

Prepared By: Ellis J. Smith
Senior Technical Consultant
Phone: 314-473-3392

JH:\MSDS\CURRENT\DV.105

MATERIAL SAFETY DATA SHEET

Date: 09/15/95

No. 1803

A. P. GREEN INDUSTRIES, INC.
GREEN BOULEVARD, MEXICO, MO 65265
EMERGENCY TELEPHONE NUMBER — 314-473-3626

SECTION I

PRODUCT NAME: GREENLITE-28

PRODUCT TYPE: Insulating Refractory Bricks or Shapes

CHEMICAL FAMILY: SiO_2 = 33-36% Al_2O_3 = 60-63% FORMULA: Not Applicable
 Fe_2O_3 = 0.5-1% NaKO = 1.5-2.0%

SECTION II PRODUCT HAZARDOUS INGREDIENTS

<u>CHEMICAL</u>	<u>TLV-TWA</u>	<u>CAS #</u>
None — TLV for Nuisance Particulates Applies (PNOC)	10 mg/m ³ * Total Dust	None

*Source: American Conference of Governmental Industrial Hygienists, 1994-1995.

SECTION III PHYSICAL DATA

SOLUBILITY IN WATER: None VOLATILES BY VOLUME (%): None
SPECIFIC GRAVITY: 2.0 MELTING POINT: Not Applicable
APPEARANCE AND ODOR: Off-white solid; no odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: None
EXTINGUISHING MEDIA: Not Combustable
SPECIAL FIRE FIGHTING PROCEDURES: None

UNUSUAL FIRE AND EXPLOSION HAZARDS: None Known

SECTION V HEALTH HAZARD DATA

EFFECT OF OVEREXPOSURE:

EYES: ACUTE: Dust or chips can cause mechanical irritation.
CHRONIC: None Known

SKIN: ACUTE: Can cause mechanical abrasion or cuts.

CHRONIC: None Known

INHALATION: ACUTE: Dust, if present, may cause upper respiratory irritation.
CHRONIC: Dust may cause lung damage if inhaled on a long-term basis.

INGESTION: ACUTE: Unknown
CHRONIC: Unknown

EYES: Immediately flush with clean water for 15 minutes. If irritation occurs, consult physician.

SKIN: Treat abrasions or cuts using standard first aid procedures.

INHALATION: Remove to fresh air. Seek medical attention.

INGESTION: Contact physician immediately. Do not induce vomiting unless instructed to do so by physician. Product is non-toxic as supplied, but its abrasive nature could damage internal organs.

SECTION VI
REACTIVITY DATA

STABILITY: Stable

INCOMPATIBILITY: None known

HAZARDOUS POLYMERIZATION: Will not occur

SECTION VII
SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: For broken shapes or fragments, sweep, shovel up, or pick up.

WASTE DISPOSAL METHOD: May be disposed of in an approved landfill, in accordance with local, state, and federal regulations.

SECTION VIII
SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Use NIOSH approved respirator when cutting or removing this product after service.

VENTILATION: General mechanical ventilation is usually adequate.

EYE PROTECTION: Goggles or safety glasses with side shields should be worn.

OTHER PROTECTION: Wear leather gloves and long-sleeved and long-legged clothing to protect hands, arms and legs from skin contact or abrasion. Safety shoes should be worn to protect feet from accidentally dropped bricks or shapes.

SECTION IX
SPECIAL PRECAUTIONS

NIOSH approved respirators should be worn any time that refractories are torn out after service. While some respiratory hazard and/or nuisance dust may exist from the product itself, other foreign substances may warrant additional precautions during tearout and disposal.

This MSDS provides the toxic chemical "SUPPLIER INFORMATION" required under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR 372. Toxic chemical information, if applicable to the product(s) named, is located in **Section II - HAZARDOUS INGREDIENTS** section of the MSDS. This information is subject to the toxic chemical reporting requirements of Section 313 and must be included in all MSDSs that are copied and distributed for this product.

This material safety data sheet contains confidential proprietary information and is not to be disclosed to the general public or to competition except as required by law. The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with A. P. Green Industries, Inc. or not. This information is offered solely for use in your evaluation of this product in respect to safety, health, and environmental hazards.

Prepared By: Ellis J. Smith
Title: Senior Technical Consultant
Phone: (314) 473-3392

JH:\MSDS\CURRENT\GL28.095

MATERIAL SAFETY DATA SHEET

6903

Date: 09/13/96

No. 6903

A. P. GREEN INDUSTRIES, INC.
GREEN BOULEVARD, MEXICO, MO 65265
EMERGENCY TELEPHONE NUMBER — 573-473-3626

SECTION I

PRODUCT NAME: ALTEX[®] 85B

PRODUCT TYPE: Refractory Bricks or Shapes

NFPA/WHMIS Rating: 1-0-0

CHEMICAL FAMILY: Al_2O_3 = 82-83% SiO_2 = 8-9% **FORMULA:** Not Applicable
 Fe_2O_3 = 1-2% TiO_2 = 2-4%
 NaKO = <1%

SECTION II

PRODUCT HAZARDOUS INGREDIENTS

<u>CHEMICAL</u>	<u>TLV-TWA</u>	<u>CAS #</u>
Cristobalite (SiO_2) (5-12%)	0.05 mg/m ³ * Respirable Dust	14464-46-1
Quartz (SiO_2) (0-2%)	0.1 mg/m ³ * Respirable Dust	14808-60-7
Corundum (Al_2O_3) (20-30%)	10 mg/m ³ * Total Dust	1344-28-1

*Source: American Conference of Governmental Industrial Hygienists, 1995-1996.

SECTION III

HAZARDS INFORMATION

This product contains crystalline silica. Prolonged exposure to dust may cause silicosis, a progressive pneumoconiosis, or other respiratory diseases. International Agency for Research on Cancer (IARC) has classified crystalline silica as a Class 2A carcinogen. Their study concluded that sufficient evidence for carcinogenicity exists in experimental animals and that limited evidence for carcinogenicity exists in humans.

Dust from product at any stage of its use or during tear-out after service may, especially on long exposure, lead to lung disease unless respiratory protection is employed. NIOSH approved respirators should be worn any time that refractories are torn out after service. While a respiratory hazard and/or nuisance dust may exist from the product itself, other foreign substances may warrant additional precautions during tearout and disposal.

SECTION IV

FIRST AID MEASURES

EFFECT OF OVEREXPOSURE:

EYES: ACUTE: Dust or chips can cause mechanical irritation.
CHRONIC: None Known

<u>SKIN:</u>	ACUTE:	Can cause mechanical abrasion or cuts.
	CHRONIC:	None Known
<u>INHALATION:</u>	ACUTE:	Dust, if present, may cause upper respiratory irritation.
	CHRONIC:	Long-term exposure to dust may cause lung damage.
<u>INGESTION:</u>	ACUTE:	Unknown
	CHRONIC:	Unknown

FIRST AID MEASURES:

EYES: Flush with clean water for 15 minutes. If irritation occurs, consult physician.

SKIN: Wash with soap and water. If irritation occurs, consult physician.

INHALATION: Remove to fresh air. Seek medical attention.

INGESTION: Contact physician immediately. Do not induce vomiting unless instructed to do so by physician. Product is non-toxic as supplied, but its abrasive nature could damage internal organs.

SECTION V
FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES: None

EXTINGUISHING MEDIA: Not Combustible

FIRE FIGHTING INSTRUCTIONS: No special instructions.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

SECTION VI
ACCIDENTAL RELEASE MEASURES

SMALL/LARGE SPILL: For broken shapes or fragments, sweep, shovel up, or pick up and place in a container for disposal.

SECTION VII
HANDLING AND STORAGE

Store in a dry place, away from extreme heat. Product is non-flammable.

SECTION VIII
EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General mechanical ventilation is usually adequate (SECTION II).

RESPIRATORY PROTECTION: Use a NIOSH approved respirator when working around dried material and when removing this product after service.

EYE PROTECTION: Goggles or safety glasses with side shields should be worn.

SKIN PROTECTION: Impervious gloves and long-sleeved and long-legged clothing should be worn to prevent skin contact.

OTHER: Safety shoes should be worn to prevent foot injury from accidentally dropped bricks or shapes.

SECTION IX
PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Light Buffed Colored, Solid		
BOILING POINT:	Not Applicable	pH:	Not Applicable
SOLUBILITY IN WATER:	None	ODOR:	None
SPECIFIC GRAVITY:	3.2-3.3	MELTING POINT:	Not Applicable

SECTION X
STABILITY AND REACTIVITY

Product is stable under normal conditions of use, storage, and transportation.

Product can react with concentrated acids.

SECTION XI
TOXICOLOGICAL INFORMATION

LD₅₀ or LC₅₀ for oral, dermal, or inhalation routes of administration: no data for product.

SECTION XII
ECOLOGICAL INFORMATION

Ecotoxicological/chemical fate information: not available.

SECTION XIII
DISPOSAL CONSIDERATIONS

As supplied, product may be disposed of in an approved landfill, in accordance with federal, state, and local regulations.

Supplier can make no statement concerning disposal of used product, since product may become contaminated by hazardous materials during use.

SECTION XIV
TRANSPORT INFORMATION

U.S.A. DOT:	Not Regulated
Canadian TDG Hazard Class & PIN:	Not Regulated

SECTION XV
REGULATORY INFORMATION

TSCA Status: All Components Listed

Canadian DSL: All Components Listed

SARA Title III, Section 313: This MSDS provides the toxic chemical "SUPPLIER INFORMATION" required under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR 372. Toxic chemical information, if applicable to the product(s) named, is located in **Section II - HAZARDOUS INGREDIENTS** section of the MSDS. This information is subject to the toxic chemical reporting requirements of Section 313 and must be included in all MSDSs that are copied and distributed for this product.

SECTION XVI
OTHER INFORMATION

MSDS Status: New format

Note: This material safety data sheet contains confidential proprietary information and is not to be disclosed to the general public or to competition except as required by law. The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with A. P. Green Industries, Inc. or not. This information is offered solely for use in your evaluation of this product in respect to safety, health, and environmental hazards.

Prepared By: Ellis J. Smith
Senior Technical Consultant
Phone: 573-473-3392

JH:\MSDS\CURRENT\AT85B.096

MATERIAL SAFETY DATA SHEET

Date: 01/05/96

Nos. 3912, 4990, 1286
7153, 6915, 3913, 1650, 3915
3916, 3917, 7147, 3918, 3919

A. P. GREEN INDUSTRIES, INC.
GREEN BOULEVARD, MEXICO, MO 65265
EMERGENCY TELEPHONE NUMBER — 573-473-3626

SECTION I

PRODUCT NAME:

BRICK MIX 1002	HIAC [®] K	PRAIRIE
CENTURION [®]	HIAC [®] K CB BF	R-2009
CLIPPER [®] AH	KX-99 [®]	SDS MULTIHOLE CHECKER
CLIPPER [®] DP	KX-99 [®] BF	SUPER DUTY (was General Refrac. prod)
CLIPPER [®] HB	KX-99 [®] BF AH	SUPER DUTY (Refractory Anchor)
CLIPPER [®] S	MEX-KO	YUKON
CLIPPER [®] SM	MEX-KO "900"	
CLIPPER [®] "900"		

PRODUCT TYPE: Super Duty Refractory Bricks or Shapes

CHEMICAL FAMILY: SiO₂ = 50-54% Al₂O₃ = 42-45% FORMULA: Not Applicable
Fe₂O₃ = 1-2% NaKO = 0.5-1%

SECTION II

PRODUCT HAZARDOUS INGREDIENTS

<u>CHEMICAL</u>	<u>TLV-TWA</u>	<u>CAS #</u>
Cristobalite* (SiO ₂)	0.05 mg/m ³ ** Respirable Dust	14464-46-1
Quartz* (SiO ₂)	0.1 mg/m ³ ** Respirable Dust	14808-60-7

*Not mechanically separate from each other or from other mineralogical phases in product as supplied.

**Source: American Conference of Governmental Industrial Hygienists, 1994-1995.

SECTION III

HAZARDS INFORMATION

This product contains crystalline silica. Prolonged exposure to dust may cause silicosis, a progressive pneumoconiosis, or other respiratory diseases. International Agency for Research on Cancer (IARC) has classified crystalline silica as a Class 2A carcinogen. Their study concluded that sufficient evidence for carcinogenicity exists in experimental animals and that limited evidence for carcinogenicity exists in humans.

Dust from product at any stage of its use or during tear-out after service may, especially on long exposure, lead to lung disease unless respiratory protection is employed. NIOSH approved respirators should be worn any time that refractories are torn out after service. While a respiratory hazard and/or

nuisance dust may exist from the product itself, other foreign substances may warrant additional precautions during tearout and disposal.

SECTION IV
FIRST AID MEASURES

EFFECT OF OVEREXPOSURE:

EYES: ACUTE: Dust or chips can cause mechanical irritation.
CHRONIC: None Known

SKIN: ACUTE: Can cause mechanical abrasion or cuts.
CHRONIC: None Known

INHALATION: ACUTE: Dust, if present, may cause upper respiratory irritation.
CHRONIC: Long-term exposure to dust may cause lung damage.

INGESTION: ACUTE: Unknown
CHRONIC: Unknown

FIRST AID MEASURES:

EYES: Flush with clean water for 15 minutes. If irritation occurs, consult physician.

SKIN: Wash with soap and water. If irritation occurs, consult physician.

INHALATION: Remove to fresh air. Seek medical attention.

INGESTION: Contact physician immediately. Do not induce vomiting unless instructed to do so by physician. Product is non-toxic as supplied, but its abrasive nature could damage internal organs.

SECTION V
FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES: None

EXTINGUISHING MEDIA: Not Combustible

FIRE FIGHTING INSTRUCTIONS: No special instructions.

SECTION VI
ACCIDENTAL RELEASE MEASURES

SMALL/LARGE SPILL: For broken shapes or fragments, sweep, shovel up, or pick up and place in a container for disposal.

SECTION VII
HANDLING AND STORAGE

Store in a dry place, away from extreme heat. Product is non-flammable.

SECTION VIII
EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General mechanical ventilation is usually adequate (SECTION II).

RESPIRATORY PROTECTION: Use a NIOSH approved respirator when removing this product after service.

EYE PROTECTION: Goggles or safety glasses with side shields should be worn.

SKIN PROTECTION: Impervious gloves and long-sleeved and long-legged clothing should be worn to prevent skin contact.

OTHER: Safety shoes should be worn to prevent foot injury from accidentally dropped bricks or shapes.

SECTION IX
PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Off-white to brown solid		
BOILING POINT:	Not Applicable	pH:	7
SOLUBILITY IN WATER:	None	ODOR:	None
SPECIFIC GRAVITY:	2.6-2.7	MELTING POINT:	Not Applicable

SECTION X
STABILITY AND REACTIVITY

Product is stable under normal conditions of use, storage, and transportation.

Product can react with concentrated acids.

SECTION XI
TOXICOLOGICAL INFORMATION

LD₅₀ or LC₅₀ for oral, dermal, or inhalation routes of administration: no data for product.

SECTION XII
ECOLOGICAL INFORMATION

Ecotoxicological/chemical fate information: not available.

SECTION XIII
DISPOSAL CONSIDERATIONS

As supplied, product may be disposed of in an approved landfill, in accordance with federal, state, and local regulations.

Supplier can make no statement concerning disposal of used product, since product may become contaminated by hazardous materials during use.

SECTION XIV
TRANSPORT INFORMATION

U.S.A. DOT: Not Regulated
Canadian TDG Hazard Class & PIN: Not Regulated

SECTION XV
REGULATORY INFORMATION

TSCA Status: All Components Listed

Canadian DSL: All Components Listed

SARA Title III, Section 313: This MSDS provides the toxic chemical "SUPPLIER INFORMATION" required under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR 372. Toxic chemical information, if applicable to the product(s) named, is located in **Section II - HAZARDOUS INGREDIENTS** section of the MSDS. This information is subject to the toxic chemical reporting requirements of Section 313 and must be included in all MSDSs that are copied and distributed for this product.

SECTION XVI
OTHER INFORMATION

MSDS Status: New format

Note: This material safety data sheet contains confidential proprietary information and is not to be disclosed to the general public or to competition except as required by law. The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with A. P. Green Industries, Inc. or not. This information is offered solely for use in your evaluation of this product in respect to safety, health, and environmental hazards.

Prepared By: Ellis J. Smith
Senior Technical Consultant
Phone: 573-473-3392

JH:\MSDS\CURRENT\BM1002.016

MATERIAL SAFETY DATA SHEET

Date: 09/13/96

Nos. 1905, 5120, 5111

A. P. GREEN INDUSTRIES, INC.
GREEN BOULEVARD, MEXICO, MO 65265
EMERGENCY TELEPHONE NUMBER — 573-473-3626

SECTION I

<u>PRODUCT NAME:</u>	SUPER HYBOND [®]	GREENGUN-45
	SUPER HYBOND [®] Plus	GREENGUN-45 Plus
	SUPER HYBOND [®] GR	SUPER BOND
	SUPER HYBOND [®] GR Plus	SUPER BOND Plus
	SUPER HYBOND [®] J	
	SUPER HYBOND [®] J Plus	
	SUPER HYBOND [®] S	
	SUPER HYBOND [®] S Plus	

PRODUCT TYPE: Castable Refractory

NFPA/WHMIS Rating: 1-0-0

<u>CHEMICAL FAMILY:</u>	SiO ₂ = 48-51 %	Al ₂ O ₃ = 43-46 %	<u>FORMULA:</u> Not Applicable
	Fe ₂ O ₃ = 1-2 %	TiO ₂ = 1-3 %	
	NaKO = 1 %		

SECTION II PRODUCT HAZARDOUS INGREDIENTS

<u>CHEMICAL</u>	<u>TLV-TWA</u>	<u>CAS #</u>
Cristobalite (SiO ₂) (3-12%)	0.05 mg/m ³ * Respirable Dust	14464-46-1
Quartz (SiO ₂) (1-4%)	0.1 mg/m ³ * Respirable Dust	14808-60-7
Aluminum Sulfate (<5%)	2 mg/m ³ *	10043-01-3
Glass Cullet (Powdered Glass) (<5%)	(None)	(None)

*Source: American Conference of Governmental Industrial Hygienists, 1995-1996.

SECTION III HAZARDS INFORMATION

Since product contains aluminum sulfate, SO_x fumes may be given off during burn-in.

This product contains crystalline silica. Prolonged exposure to dust may cause silicosis, a progressive pneumoconiosis, or other respiratory diseases. International Agency for Research on Cancer (IARC) has classified crystalline silica as a Class 2A carcinogen. Their study concluded that sufficient evidence for carcinogenicity exists in experimental animals and that limited evidence for carcinogenicity exists in humans.

Dust from product at any stage of its use or during tear-out after service may, especially on long exposure, lead to lung disease unless respiratory protection is employed. NIOSH approved respirators should be worn any time that refractories are torn out after service. While a respiratory hazard and/or nuisance dust may exist from the product itself, other foreign substances may warrant additional precautions during tearout and disposal.

SECTION IV **FIRST AID MEASURES**

EFFECT OF OVEREXPOSURE:

<u>EYES:</u>	ACUTE:	Dust can cause mechanical irritation. Product's cement can cause eye irritation.
	CHRONIC:	None Known
<u>SKIN:</u>	ACUTE:	Product's cement can cause skin irritation.
	CHRONIC:	None Known
<u>INHALATION:</u>	ACUTE:	Dust generated can cause breathing discomfort or irritation.
	CHRONIC:	Long-term exposure to dust may cause lung damage.
<u>INGESTION:</u>	ACUTE:	Unknown
	CHRONIC:	Unknown

FIRST AID MEASURES:

EYES: Flush with clean water for 15 minutes. If irritation occurs, consult physician.

SKIN: Wash with soap and water. If irritation occurs, consult physician.

INHALATION: Remove to fresh air. Seek medical attention.

INGESTION: Contact physician immediately. Do not induce vomiting unless instructed to do so by physician. Product is non-toxic as supplied, but its abrasive nature could damage internal organs.

SECTION V **FIRE FIGHTING MEASURES**

FLAMMABLE PROPERTIES: None

EXTINGUISHING MEDIA: Not Combustible

FIRE FIGHTING INSTRUCTIONS: No special instructions.

UNUSUAL FIRE AND EXPLOSION HAZARDS: The aluminum sulfate present, if heated to decomposition, will emit toxic fumes of SO_x.

SECTION VI
ACCIDENTAL RELEASE MEASURES

SMALL/LARGE SPILL: If dry, predampen and sweep or shovel up. If wet (after mixing with water for use), sweep or shovel up and place in a container for disposal.

SECTION VII
HANDLING AND STORAGE

Store in a dry place. Product is non-flammable.

SECTION VIII
EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General mechanical ventilation is usually adequate (SECTION II).

RESPIRATORY PROTECTION: Use a NIOSH approved respirator when working around dried material and when removing this product after service.

EYE PROTECTION: Goggles or safety glasses with side shields should be worn.

SKIN PROTECTION: Gloves and long-sleeved and long-legged clothing should be worn to prevent skin contact.

OTHER: Safety shoes should be worn to prevent foot injury from accidentally dropped bags of castable.

SECTION IX
PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Gray, Granular Mixture		
BOILING POINT:	Not Applicable	pH:	2-4
SOLUBILITY IN WATER:	None	ODOR:	None
SPECIFIC GRAVITY:	2.6	MELTING POINT:	Not Applicable

SECTION X
STABILITY AND REACTIVITY

Product is stable under normal conditions of use, storage, and transportation.

Product can react with concentrated acids.

SECTION XI
TOXICOLOGICAL INFORMATION

LD₅₀ or LC₅₀ for oral, dermal, or inhalation routes of administration: no data for product.

SECTION XII
ECOLOGICAL INFORMATION

Ecotoxicological/chemical fate information: not available.

SECTION XIII
DISPOSAL CONSIDERATIONS

As supplied, product may be disposed of in an approved landfill, in accordance with federal, state, and local regulations.

Supplier can make no statement concerning disposal of used product, since product may become contaminated by hazardous materials during use.

SECTION XIV
TRANSPORT INFORMATION

U.S.A. DOT: Not Regulated
Canadian TDG Hazard Class & PIN: Not Regulated

SECTION XV
REGULATORY INFORMATION

TSCA Status: All Components Listed
Canadian DSL: All Components Listed
SARA Title III, Section 313: This MSDS provides the toxic chemical "SUPPLIER INFORMATION" required under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR 372. Toxic chemical information, if applicable to the product(s) named, is located in **Section II - HAZARDOUS INGREDIENTS** section of the MSDS. This information is subject to the toxic chemical reporting requirements of Section 313 and must be included in all MSDSs that are copied and distributed for this product.

SECTION XVI
OTHER INFORMATION

MSDS Status: New Format, Replaces MSDS Dated 09/01/93

Note: This material safety data sheet contains confidential proprietary information and is not to be disclosed to the general public or to competition except as required by law. The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with A. P. Green Industries, Inc. or not. This information is offered solely for use in your evaluation of this product in respect to safety, health, and environmental hazards.

Prepared By: Ellis J. Smith
Senior Technical Consultant
Phone: 573-473-3392

JH:\MSDS\CURRENT\SHYBOND.096

MATERIAL SAFETY DATA SHEET 1997

Date: 10/31/97

No. 1997

A. P. GREEN INDUSTRIES, INC.
GREEN BOULEVARD, MEXICO, MO 65265

APGI Emergency Telephone Number — Call 573-473-3626
Transportation Emergencies — Contact CHEMTREC at 800-424-9300
International Emergencies — Contact CHEMTREC at 703-527-3887
Health Emergencies — Contact Your Local Poison Center

SECTION I

PRODUCT NAME: GREFPATCH® 85 GREFPATCH® 85 Wet
GREFPATCH® 85 Plus GREFPATCH® 85 Wet Plus

PRODUCT TYPE: Refractory Patching Plaster

Canadian WHMIS Classification: D,2,E

NFPA Rating: 1-0-0

CHEMICAL FAMILY: SiO₂ = 9-11% Al₂O₃ = 83-85% **FORMULA:** Not Applicable
Fe₂O₃ = 1-2% NaKO = <1%
TiO₂ = 1-2% P₂O₅ = 2-3%

SECTION II

PRODUCT HAZARDOUS INGREDIENTS

<u>CHEMICAL</u>	<u>TLV-TWA</u>	<u>CAS #</u>
Cristobalite (SiO ₂) (3-10%)	0.05 mg/m ³ * Respirable Dust	14464-46-1
Quartz (SiO ₂) (3-4%)	0.1 mg/m ³ * Respirable Dust	14808-60-7
Alumina (Al ₂ O ₃) (< 2%)	10 mg/m ³ * Total Dust	1344-28-1
Phosphoric Acid (H ₃ PO ₄) (4-5%)	1 mg/m ³ *	7664-38-2**

* Source: American Conference of Governmental Industrial Hygienists, 1996.

** This product contains phosphoric acid, CAS No. 7664-38-2, which is reportable under Section 313 of Title III of SARA and 40 CFR Part 372. For purposes of reporting environmental discharge use 5% phosphoric acid content.

SECTION III

HAZARDS INFORMATION

Since this product contains phosphoric acid, toxic PO_x fumes can be formed on burn in.

This product contains crystalline silica. Prolonged exposure to dust may cause silicosis, a progressive pneumoconiosis, or other respiratory diseases. International Agency for Research on Cancer (IARC) has classified crystalline silica as Group 1. The agency states there is sufficient evidence of carcinogenicity in humans. Reference: IARC Monograph 68.

Dust from product at any stage of its use or during tear-out after service may, especially on long exposure, lead to lung disease unless respiratory protection is employed. NIOSH approved respirators should be worn any time that refractories are torn out after service. While a respiratory hazard and/or nuisance dust may exist from the product itself, other foreign substances may warrant additional precautions during tearout and disposal.

SECTION IV **FIRST AID MEASURES**

EFFECT OF OVEREXPOSURE:

<u>EYES:</u>	ACUTE:	Dust can cause mechanical irritation. Phosphoric acid can cause eye injury.
	CHRONIC:	None Known
<u>SKIN:</u>	ACUTE:	Can cause mechanical abrasion. Phosphoric acid can cause skin injury.
	CHRONIC:	None Known
<u>INHALATION:</u>	ACUTE:	Dust, if present, can cause upper respiratory irritation.
	CHRONIC:	Long-term exposure to dust may cause lung damage.
<u>INGESTION:</u>	ACUTE:	Phosphoric acid is moderately toxic if ingested.
	CHRONIC:	Unknown

FIRST AID MEASURES:

EYES: Flush with clean water for 15 minutes. If irritation occurs, consult physician.

SKIN: Wash with soap and water. Seek medical attention.

INHALATION: Remove to fresh air. Seek medical attention.

INGESTION: Contact physician immediately. Do not induce vomiting unless instructed to do so by physician. Physician or poison control center should be advised that product contains phosphoric acid (5%). Product is non-toxic as supplied, but its abrasive nature could damage internal organs.

SECTION V **FIRE FIGHTING MEASURES**

FLAMMABLE PROPERTIES: None

EXTINGUISHING MEDIA: Not Combustible

FIRE FIGHTING INSTRUCTIONS: No special instructions.

UNUSUAL FIRE AND EXPLOSION HAZARDS: If heated to decomposition, the phosphoric acid will emit toxic fumes of PO₄.

SECTION VI **ACCIDENTAL RELEASE MEASURES**

SMALL/LARGE SPILL: Sweep or shovel up and place in a container for disposal. Pre-dampening reduces tendency to dust.

SECTION VII
HANDLING AND STORAGE

Store in a dry place. Product is non-flammable.

SECTION VIII
EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General mechanical ventilation is usually adequate (SECTION II).

RESPIRATORY PROTECTION: Use a NIOSH approved respirator when working around dried material and when removing this product after service.

EYE PROTECTION: Goggles or safety glasses with side shields should be worn.

SKIN PROTECTION: Rubber gloves and long-sleeved and long-legged clothing should be worn to prevent skin contact.

OTHER: Safety shoes should be worn to prevent foot injury from accidentally dropped containers of mortar.

SECTION IX
PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Gray Granular Mixture		
BOILING POINT:	Not Applicable	pH:	3-5
SOLUBILITY IN WATER:	None	ODOR:	None
SPECIFIC GRAVITY:	2.7	MELTING POINT:	Not Applicable

SECTION X
STABILITY AND REACTIVITY

Product is stable under normal conditions of use, storage, and transportation.

Product can react with concentrated acids.

SECTION XI
TOXICOLOGICAL INFORMATION

LD₅₀ or LC₅₀ for oral, dermal, or inhalation routes of administration: no data for product.

SECTION XII
ECOLOGICAL INFORMATION

Ecotoxicological/chemical fate information: not available.

SECTION XIII
DISPOSAL CONSIDERATIONS

As supplied, product may be disposed of in an approved landfill, in accordance with federal, state, and local regulations.

Supplier can make no statement concerning disposal of used product, since product may become contaminated by hazardous materials during use.

SECTION XIV
TRANSPORT INFORMATION

U.S.A. DOT: Not Regulated
Canadian TDG Hazard Class & PIN: Not Regulated

SECTION XV
REGULATORY INFORMATION

TSCA Status: All Components Listed

Canadian DSL: All Components Listed

SARA Title III, Section 313: This MSDS provides the toxic chemical "SUPPLIER INFORMATION" required under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR 372. Toxic chemical information, if applicable to the product(s) named, is located in **Section II - HAZARDOUS INGREDIENTS** section of the MSDS. This information is subject to the toxic chemical reporting requirements of Section 313 and must be included in all MSDSs that are copied and distributed for this product.

SECTION XVI
OTHER INFORMATION

MSDS Status: Replaces MSDS Dated 05/15/96

Note: This material safety data sheet contains confidential proprietary information and is not to be disclosed to the general public or to competition except as required by law. The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with A. P. Green Industries, Inc. or not. This information is offered solely for use in your evaluation of this product in respect to safety, health, and environmental hazards.

Prepared By: Ellis J. Smith
Senior Technical Consultant
Phone: 573-473-3392

JH:\MSDS\CURRENT\GPAT85.107

MATERIAL SAFETY DATA SHEET 1062

Date: 09/26/97

No. 1062

A. P. GREEN INDUSTRIES, INC.
GREEN BOULEVARD, MEXICO, MO 65265

APGI Emergency Telephone Number — Call 573-473-3626
Transportation Emergencies — Contact CHEMTREC at 800-424-9300
International Emergencies — Contact CHEMTREC at 703-527-3887
Health Emergencies — Contact Your Local Poison Center

SECTION I

PRODUCT NAME:	GREENPAK-85-P	GREENPAK-85-MP
	GREENPAK-85-P Plus	GREENPAK-85-MP Plus
	GREENPAK-85-P GR	GREENPAK-85-MP RAM
	GREENPAK-85-P GR Plus	GREENPAK-85-MP RAM Plus
	GREENPAK-85-PF	GREENPAK-85-MP S
	GREENPAK-85-PF Plus	GREENPAK-85-MP S Plus

PRODUCT TYPE: Plastic Refractory (Solid or Wet)

Canadian WHMIS Classification: D,2,E

NFPA Rating: 1-0-0

CHEMICAL FAMILY:	SiO ₂ = 6-14%	Al ₂ O ₃ = 82-90%	FORMULA: Not Applicable
	Fe ₂ O ₃ = 1-2%	TiO ₂ = 2-3%	
	NaKO = <1%	P ₂ O ₅ = 3-4%	

SECTION II

PRODUCT HAZARDOUS INGREDIENTS

<u>CHEMICAL</u>	<u>TLV-TWA</u>	<u>CAS #</u>
Cristobalite (SiO ₂) (<10%)	0.05 mg/m ³ * Respirable Dust	14464-46-1
Quartz (SiO ₂) (<2%)	0.1 mg/m ³ * Respirable Dust	14808-60-7
Alumina (Al ₂ O ₃) (<30%)	10 mg/m ³ * Total Dust	1344-28-1
Phosphoric Acid (H ₃ PO ₄) (<10%)	1 mg/m ³ *	7664-38-2**

*Source: American Conference of Governmental Industrial Hygienists, 1996.

**This product contains phosphoric acid, CAS No. 7664-38-2, which is reportable under Section 313 of Title III of SARA and 40 CFR Part 372. For purposes of reporting environmental discharge use 6% phosphoric acid content.

SECTION III

HAZARDS INFORMATION

Since this product contains phosphoric acid, toxic PO_x fumes can be formed on burn in.

This product contains crystalline silica. Prolonged exposure to dust may cause silicosis, a progressive pneumoconiosis, or other respiratory diseases. International Agency for Research on Cancer (IARC) has classified crystalline silica as Group 1. The agency states there is sufficient evidence of carcinogenicity in humans. Reference: IARC Monograph 68.

Dust from product at any stage of its use or during tear-out after service may, especially on long exposure, lead to lung disease unless respiratory protection is employed. NIOSH approved respirators should be worn any time that refractories are torn out after service. While a respiratory hazard and/or nuisance dust may exist from the product itself, other foreign substances may warrant additional precautions during tearout and disposal.

SECTION IV **FIRST AID MEASURES**

EFFECT OF OVEREXPOSURE:

<u>EYES:</u>	ACUTE:	Dust or aggregate can cause mechanical irritation. Phosphoric acid can cause eye injury.
	CHRONIC:	None Known
<u>SKIN:</u>	ACUTE:	Can cause mechanical abrasion. Phosphoric acid can cause skin injury.
	CHRONIC:	None Known
<u>INHALATION:</u>	ACUTE:	Dust, if present, can cause upper respiratory irritation.
	CHRONIC:	Long-term exposure to dust may cause lung damage.
<u>INGESTION:</u>	ACUTE:	Phosphoric acid is moderately toxic if ingested.
	CHRONIC:	Unknown

FIRST AID MEASURES:

EYES: Flush with clean water for 15 minutes. Promptly, consult physician.

SKIN: Promptly wash with soap and water. If irritation occurs, consult physician.

INHALATION: Remove to fresh air. Seek medical attention.

INGESTION: Contact physician immediately. Do not induce vomiting unless instructed to do so by physician. Physician or poison control center should be advised that product contains phosphoric acid (<7%). Product is non-toxic as supplied, but its abrasive nature could damage internal organs.

SECTION V **FIRE FIGHTING MEASURES**

FLAMMABLE PROPERTIES: None

EXTINGUISHING MEDIA: Not Combustible

FIRE FIGHTING INSTRUCTIONS: No special instructions.

UNUSUAL FIRE AND EXPLOSION HAZARDS: If heated to decomposition, the phosphoric acid will emit toxic fumes of PO_x.

SECTION VI
ACCIDENTAL RELEASE MEASURES

SMALL/LARGE SPILL: Sweep, shovel up, or pick up and place in a container for disposal.

SECTION VII
HANDLING AND STORAGE

Store in a dry place. Product is non-flammable.

SECTION VIII
EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General mechanical ventilation is usually adequate (SECTION II).

RESPIRATORY PROTECTION: Use a NIOSH approved respirator when working around dried material and when removing this product after service.

EYE PROTECTION: Goggles or safety glasses with side shields should be worn.

SKIN PROTECTION: Leather gloves and long-sleeved and long-legged clothing should be worn to prevent skin contact.

OTHER: Safety shoes should be worn to prevent foot injury from accidentally dropped containers of product.

SECTION IX
PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Gray Mixture (Solid or Wet)		
BOILING POINT:	Not Applicable	pH:	3-5
SOLUBILITY IN WATER:	None	ODOR:	None
SPECIFIC GRAVITY:	3.2-3.4	MELTING POINT:	Not Applicable

SECTION X
STABILITY AND REACTIVITY

Product is stable under normal conditions of use, storage, and transportation.

Product can react with concentrated acids.

SECTION XI
TOXICOLOGICAL INFORMATION

LD₅₀ or LC₅₀ for oral, dermal, or inhalation routes of administration: no data for product.

SECTION XII
ECOLOGICAL INFORMATION

Ecotoxicological/chemical fate information: not available.

SECTION XIII
DISPOSAL CONSIDERATIONS

As supplied, product may be disposed of in an approved landfill, in accordance with federal, state, and local regulations.

Supplier can make no statement concerning disposal of used product, since product may become contaminated by hazardous materials during use.

SECTION XIV
TRANSPORT INFORMATION

U.S.A. DOT: Not Regulated
Canadian TDG Hazard Class & PIN: Not Regulated

SECTION XV
REGULATORY INFORMATION

TSCA Status: All Components Listed

Canadian DSL: All Components Listed

SARA Title III, Section 313: This MSDS provides the toxic chemical "SUPPLIER INFORMATION" required under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR 372. Toxic chemical information, if applicable to the product(s) named, is located in **Section II - HAZARDOUS INGREDIENTS** section of the MSDS. This information is subject to the toxic chemical reporting requirements of Section 313 and must be included in all MSDSs that are copied and distributed for this product.

SECTION XVI
OTHER INFORMATION

MSDS Status: Replaces MSDS Dated 02/05/97

Note: This material safety data sheet contains confidential proprietary information and is not to be disclosed to the general public or to competition except as required by law. The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with A. P. Green Industries, Inc. or not. This information is offered solely for use in your evaluation of this product in respect to safety, health, and environmental hazards.

Prepared By: Ellis J. Smith
Senior Technical Consultant
Phone: 573-473-3392

MATERIAL SAFETY DATA SHEET

Date: 10/24/96

No. 1062

A. P. GREEN INDUSTRIES, INC.
GREEN BOULEVARD, MEXICO, MO 65265
EMERGENCY TELEPHONE NUMBER — 573-473-3626

SECTION I

PRODUCT NAME: GREENPAK-85-P GREENPAK-85-P GR
GREENPAK-85-P Plus GREENPAK-85-P GR Plus
GREENPAK-85-PF GREENPAK-85-MP
GREENPAK-85-PF Plus GREENPAK-85 MP Plus
GREENPAK-85-MP S
GREENPAK-85-MP S Plus

PRODUCT TYPE: Plastic Refractory

NFPA/WHMIS Rating: 1-0-0

CHEMICAL FAMILY: SiO₂ = 6-14% Al₂O₃ = 82-90% **FORMULA:** Not Applicable
Fe₂O₃ = 1-2% TiO₂ = 2-3%
NaKO = <1% P₂O₅ = 3-4%

SECTION II

PRODUCT HAZARDOUS INGREDIENTS

<u>CHEMICAL</u>	<u>TLV-TWA</u>	<u>CAS #</u>
Cristobalite (SiO ₂) (< 10%)	0.05 mg/m ³ * Respirable Dust	14464-46-1
Quartz (SiO ₂) (< 2%)	0.1 mg/m ³ * Respirable Dust	14808-60-7
Alumina (Al ₂ O ₃) (< 30%)	10 mg/m ³ * Total Dust	1344-28-1
Phosphoric Acid (H ₃ PO ₄) (< 10%)	1 mg/m ³ *	7664-38-2**

*Source: American Conference of Governmental Industrial Hygienists, 1995-1996.

**This product contains phosphoric acid, CAS No. 7664-38-2, which is reportable under Section 313 of Title III of SARA and 40 CFR Part 372. For purposes of reporting environmental discharge use 6% phosphoric acid content.

SECTION III

HAZARDS INFORMATION

Since this product contains phosphoric acid, toxic PO_x fumes can be formed on burn in.

This product contains crystalline silica. Prolonged exposure to dust may cause silicosis, a progressive pneumoconiosis, or other respiratory diseases. International Agency for Research on Cancer (IARC) has classified crystalline silica as a Class 2A carcinogen. Their study concluded that sufficient evidence for carcinogenicity exists in experimental animals and that limited evidence for carcinogenicity exists in humans.

Dust from product at any stage of its use or during tear-out after service may, especially on long exposure, lead to lung disease unless respiratory protection is employed. NIOSH approved respirators should be worn any time that refractories are torn out after service. While a respiratory hazard and/or nuisance dust may exist from the product itself, other foreign substances may warrant additional precautions during tearout and disposal.

SECTION IV **FIRST AID MEASURES**

EFFECT OF OVEREXPOSURE:

<u>EYES:</u>	ACUTE:	Dust or aggregate can cause mechanical irritation. Phosphoric acid can cause eye injury.
	CHRONIC:	None Known
<u>SKIN:</u>	ACUTE:	Can cause mechanical abrasion. Phosphoric acid can cause skin injury.
	CHRONIC:	None Known
<u>INHALATION:</u>	ACUTE:	Dust, if present, can cause upper respiratory irritation.
	CHRONIC:	Long-term exposure to dust may cause lung damage.
<u>INGESTION:</u>	ACUTE:	Phosphoric acid is moderately toxic if ingested.
	CHRONIC:	Unknown

FIRST AID MEASURES:

EYES: Flush with clean water for 15 minutes. Promptly, consult physician.

SKIN: Promptly wash with soap and water. If irritation occurs, consult physician.

INHALATION: Remove to fresh air. Seek medical attention.

INGESTION: Contact physician immediately. Do not induce vomiting unless instructed to do so by physician. Physician or poison control center should be advised that product contains phosphoric acid (< 7%). Product is non-toxic as supplied, but its abrasive nature could damage internal organs.

SECTION V **FIRE FIGHTING MEASURES**

FLAMMABLE PROPERTIES: None

EXTINGUISHING MEDIA: Not Combustible

FIRE FIGHTING INSTRUCTIONS: No special instructions.

UNUSUAL FIRE AND EXPLOSION HAZARDS: The phosphoric acid, if heated to decomposition, will emit toxic fumes of PO_x .

SECTION VI **ACCIDENTAL RELEASE MEASURES**

SMALL/LARGE SPILL: Sweep, shovel up, or pick up and place in a container for disposal.

SECTION VII
HANDLING AND STORAGE

Store in a dry place. Product is non-flammable.

SECTION VIII
EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General mechanical ventilation is usually adequate (SECTION II).

RESPIRATORY PROTECTION: Use a NIOSH approved respirator when working around dried material and when removing this product after service.

EYE PROTECTION: Goggles or safety glasses with side shields should be worn.

SKIN PROTECTION: Leather gloves and long-sleeved and long-legged clothing should be worn to prevent skin contact.

OTHER: Safety shoes should be worn to prevent foot injury from accidentally dropped containers of product.

SECTION IX
PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Gray, Solid	pH:	3-5
BOILING POINT:	Not Applicable	ODOR:	None
SOLUBILITY IN WATER:	None	MELTING POINT:	Not Applicable
SPECIFIC GRAVITY:	3.2-3.4		

SECTION X
STABILITY AND REACTIVITY

Product is stable under normal conditions of use, storage, and transportation.

Product can react with concentrated acids.

SECTION XI
TOXICOLOGICAL INFORMATION

LD₅₀ or LC₅₀ for oral, dermal, or inhalation routes of administration: no data for product.

SECTION XII
ECOLOGICAL INFORMATION

Ecotoxicological/chemical fate information: not available.

SECTION XIII
DISPOSAL CONSIDERATIONS

As supplied, product may be disposed of in an approved landfill, in accordance with federal, state, and local regulations.

Supplier can make no statement concerning disposal of used product, since product may become contaminated by hazardous materials during use.

SECTION XIV
TRANSPORT INFORMATION

U.S.A. DOT: Not Regulated
Canadian TDG Hazard Class & PIN: Not Regulated

SECTION XV
REGULATORY INFORMATION

TSCA Status: All Components Listed

Canadian DSL: All Components Listed

SARA Title III, Section 313: This MSDS provides the toxic chemical "SUPPLIER INFORMATION" required under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR 372. Toxic chemical information, if applicable to the product(s) named, is located in **Section II - HAZARDOUS INGREDIENTS** section of the MSDS. This information is subject to the toxic chemical reporting requirements of Section 313 and must be included in all MSDSs that are copied and distributed for this product.

SECTION XVI
OTHER INFORMATION

MSDS Status: Replaces MSDS dated 07/18/96.

Note: This material safety data sheet contains confidential proprietary information and is not to be disclosed to the general public or to competition except as required by law. The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with A. P. Green Industries, Inc. or not. This information is offered solely for use in your evaluation of this product in respect to safety, health, and environmental hazards.

Prepared By: Ellis J. Smith
Senior Technical Consultant
Phone: 573-473-3392

JH:\MSDS\CURRENT\GP85P.106

MATERIAL SAFETY DATA SHEET

Date: 06/14/96

Nos. 1062, 5153, 4979
6814, 8030, 5173

A. P. GREEN INDUSTRIES, INC.
GREEN BOULEVARD, MEXICO, MO 65265
EMERGENCY TELEPHONE NUMBER — 573-473-3626

SECTION I

PRODUCT NAME:

GREENPAK-85-P
GREENPAK-85-P Plus
GREENPAK-85-PF
GREENPAK-85-PF Plus
GREENPAK-85-P GR
GREENPAK-85-P GR Plus
GREENPAK-85-MP
GREENPAK-85-MP Plus
GREENPAK-85-MP S
GREENPAK-85-MP S Plus

GREENPAK-83-MP
GREENPAK-83-MP Plus
GREENPAK-83-P Plus
GREENPAK-83-MP S
GREENPAK-83-MP S Plus

GREENGUN-85 P
GREENGUN-85 P Plus
GREENGUN-85 MP
GREENGUN-85 MP Plus
GREENGUN-85-MPA
GREENGUN-85-MPA Plus
GREENGUN-83 P
GREENGUN-83 P Plus
GREENGUN-83 P Plus M

PRODUCT TYPE: Plastic Refractory

NFPA/WHMIS Rating: 1-0-0

CHEMICAL FAMILY: SiO₂ = 6-14% Al₂O₃ = 82-90%
Fe₂O₃ = 1-2% TiO₂ = 2-3%
NaKO = <1% P₂O₅ = 3-4%

FORMULA: Not Applicable

SECTION II

PRODUCT HAZARDOUS INGREDIENTS

<u>CHEMICAL</u>	<u>TLV-TWA</u>	<u>CAS #</u>
Cristobalite (SiO ₂) (< 10%)	0.05 mg/m ³ * Respirable Dust	14464-46-1
Quartz (SiO ₂) (< 2%)	0.1 mg/m ³ * Respirable Dust	14808-60-7
Alumina (Al ₂ O ₃) (< 30%)	10 mg/m ³ * Total Dust	1344-28-1
Phosphoric Acid (H ₃ PO ₄) (< 10%)	1 mg/m ³ **	7664-38-2***
Graphite* (< 2%)	2 mg/m ³ ** Respirable Dust	7782-42-5

*Only in GREENGUN products.

**Source: American Conference of Governmental Industrial Hygienists, 1995-1996.

***This product contains phosphoric acid, CAS No. 7664-38-2, which is reportable under Section 313 of Title III of SARA and 40 CFR Part 372. For purposes of reporting environmental discharge use 6% phosphoric acid content.

SECTION III **HAZARDS INFORMATION**

Since this product contains phosphoric acid, toxic PO_x fumes can be formed on burn in.

Under certain service conditions, mainly due to the presence of alkalis or alkaline earth compounds at high temperatures, soluble hexavalent chromium compounds may be formed. Hexavalent chrome is considered to be potentially hazardous material, requiring special disposal consideration involving an approved hazardous waste disposal site.

This product contains crystalline silica. Prolonged exposure to dust may cause silicosis, a progressive pneumoconiosis, or other respiratory diseases. International Agency for Research on Cancer (IARC) has classified crystalline silica as a Class 2A carcinogen. Their study concluded that sufficient evidence for carcinogenicity exists in experimental animals and that limited evidence for carcinogenicity exists in humans.

Dust from product at any stage of its use or during tear-out after service may, especially on long exposure, lead to lung disease unless respiratory protection is employed. NIOSH approved respirators should be worn any time that refractories are torn out after service. While a respiratory hazard and/or nuisance dust may exist from the product itself, other foreign substances may warrant additional precautions during tearout and disposal.

SECTION IV **FIRST AID MEASURES**

EFFECT OF OVEREXPOSURE:

<u>EYES:</u>	ACUTE:	Dust or aggregate can cause mechanical irritation. Phosphoric acid can cause eye injury.
	CHRONIC:	None Known
<u>SKIN:</u>	ACUTE:	Can cause mechanical abrasion. Phosphoric acid can cause skin injury.
	CHRONIC:	None Known
<u>INHALATION:</u>	ACUTE:	Dust, if present, can cause upper respiratory irritation.
	CHRONIC:	Long-term exposure to dust may cause lung damage.
<u>INGESTION:</u>	ACUTE:	Phosphoric acid is moderately toxic if ingested.
	CHRONIC:	Unknown

FIRST AID MEASURES:

EYES: Flush with clean water for 15 minutes. Promptly, consult physician.

SKIN: Promptly wash with soap and water. If irritation occurs, consult physician.

INHALATION: Remove to fresh air. Seek medical attention.

INGESTION: Contact physician immediately. Do not induce vomiting unless instructed to do so by physician. Physician or poison control center should be advised that product contains phosphoric acid (<7%). Product is non-toxic as supplied, but its abrasive nature could damage internal organs.

SECTION V
FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES: None

EXTINGUISHING MEDIA: Not Combustible

FIRE FIGHTING INSTRUCTIONS: No special instructions.

UNUSUAL FIRE AND EXPLOSION HAZARDS: The phosphoric acid, if heated to decomposition, will emit toxic fumes of PO_x.

SECTION VI
ACCIDENTAL RELEASE MEASURES

SMALL/LARGE SPILL: Sweep, shovel up, or pick up and place in a container for disposal.

SECTION VII
HANDLING AND STORAGE

Store in a dry place. Product is non-flammable.

SECTION VIII
EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General mechanical ventilation is usually adequate (SECTION II).

RESPIRATORY PROTECTION: Use a NIOSH approved respirator when working around dried material and when removing this product after service.

EYE PROTECTION: Goggles or safety glasses with side shields should be worn.

SKIN PROTECTION: Leather gloves and long-sleeved and long-legged clothing should be worn to prevent skin contact.

OTHER: Safety shoes should be worn to prevent foot injury from accidentally dropped containers of product.

SECTION IX
PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Gray, Solid	pH:	3-5
BOILING POINT:	Not Applicable	ODOR:	None
SOLUBILITY IN WATER:	None	MELTING POINT:	Not Applicable
SPECIFIC GRAVITY:	3.2-3.4		

SECTION X
STABILITY AND REACTIVITY

Product is stable under normal conditions of use, storage, and transportation.

Product can react with concentrated acids.

SECTION XI
TOXICOLOGICAL INFORMATION

LD₅₀ or LC₅₀ for oral, dermal, or inhalation routes of administration: no data for product.

SECTION XII
ECOLOGICAL INFORMATION

Ecotoxicological/chemical fate information: not available.

SECTION XIII
DISPOSAL CONSIDERATIONS

As supplied, product may be disposed of in an approved landfill, in accordance with federal, state, and local regulations.

Supplier can make no statement concerning disposal of used product, since product may become contaminated by hazardous materials during use.

SECTION XIV
TRANSPORT INFORMATION

U.S.A. DOT: Not Regulated
Canadian TDG Hazard Class & PIN: Not Regulated

SECTION XV
REGULATORY INFORMATION

TSCA Status: All Components Listed
Canadian DSL: All Components Listed
SARA Title III, Section 313: This MSDS provides the toxic chemical "SUPPLIER INFORMATION" required under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR 372. Toxic chemical information, if applicable to the product(s) named, is located in **Section II - HAZARDOUS INGREDIENTS** section of the MSDS. This information is subject to the toxic chemical reporting requirements of Section 313 and must be included in all MSDSs that are copied and distributed for this product.

SECTION XVI
OTHER INFORMATION

MSDS Status: New format, replaces MSDS dated 01/01/95.

Note: This material safety data sheet contains confidential proprietary information and is not to be disclosed to the general public or to competition except as required by law. The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with A. P. Green Industries, Inc. or not. This information is offered solely for use in your evaluation of this product in respect to safety, health, and environmental hazards.

Prepared By: Ellis J. Smith
Senior Technical Consultant
Phone: 573-473-3392
JH:\MSDS\CURRENT\GP85P.066

MATERIAL SAFETY DATA SHEET

Date: 01/01/95

Nos. 1062, 5173, 5475
4791, 4790, 4979, 5153, 6814

A. P. GREEN INDUSTRIES, INC.
GREEN BOULEVARD, MEXICO, MO. 65265
TELEPHONE NUMBER -- 314-473-3626

SECTION I

<u>PRODUCT NAME:</u>	GREENPAK-85-P	R-7011	GREENGUN-85 P
	GREENPAK-85-PF	R-7011 Plus	GREENGUN-85 P Plus
	GREENPAK-85-P Plus	R-2010	GREENPAK-83-MP
	GREENPAK-85-PF Plus	R-2010 Plus	GREENPAK-83-MP Plus
	GREENPAK-85-P GR	R-2010 GR	GREENPAK-83-P Plus
	GREENPAK-85-P GR Plus	R-2010 GR Plus	GREENPAK-83-MP S
	GREENPAK-85-MP	GREENGUN-83 P	GREENPAK-83-MP S Plus
	GREENPAK-85-MP Plus	GREENGUN-83 P Plus	GREENGUN-85 MP
	GREENPAK-85-MP S	GREENGUN-83 P Plus M	GREENGUN-85 MP Plus
	GREENPAK-85-MP S Plus		

PRODUCT TYPE: Plastic Refractory

<u>CHEMICAL FAMILY:</u>	SiO ₂ = 6-14%	Al ₂ O ₃ = 82-90%	<u>FORMULA:</u> Not Applicable
	Fe ₂ O ₃ = 1-2%	TiO ₂ = 2-3%	
	NaKO = <1%	P ₂ O ₅ = 3-4%	

Note: The above listed products differ in one or more physical characteristics but are chemically equivalent. Information given in SECTIONS II and IX of this Material Safety Data Sheet applies to each product listed.

SECTION II

PRODUCT HAZARDOUS INGREDIENTS

<u>CHEMICAL</u>	<u>TLV-TWA</u>	<u>CAS #</u>
Quartz (SiO ₂) (<2%)	0.1 mg/m ³ ** Respirable Dust	14808-60-7
Cristobalite (SiO ₂) (<10%)	0.05 mg/m ³ ** Respirable Dust	14464-46-1
Phosphoric Acid (H ₂ O ₃) (<10%)	1 mg/m ³ **	7664-38-2***
Alumina (Al ₂ O ₃) (<30%)	10 mg/m ³ ** Total Dust	1344-28-1
Graphite* (<2%)	2 mg/m ³ ** Respirable Dust	7782-42-5

*Only in GREENGUN products.

**Source: American Conference of Governmental Industrial Hygienists, 1994-1995.

***This product contains phosphoric acid, CAS No. 7664-38-2, which is reportable under Section 313 of Title III of SARA and 40 CFR Part 372. For purposes of reporting environmental discharge use 6% phosphoric acid content.

SECTION III

PHYSICAL DATA

<u>SOLUBILITY IN WATER:</u>	Slight	<u>MELTING POINT:</u> Not Applicable
<u>SPECIFIC GRAVITY:</u>	3.2-3.4	<u>pH:</u> 2-4

SECTION IV

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: None

EXTINGUISHING MEDIA: Not Combustible

SPECIAL FIRE FIGHTING PROCEDURES: None

UNUSUAL FIRE AND EXPLOSION HAZARDS: The phosphoric acid if heated to decomposition will emit toxic fumes of PO_x.

SECTION V

HEALTH HAZARD DATA

EFFECT OF OVEREXPOSURE:

<u>EYES</u>	ACUTE:	Dust or aggregate particles can cause mechanical irritation. Phosphoric acid may cause eye injury.
	CHRONIC:	None known.
<u>SKIN</u>	ACUTE:	Can cause mechanical abrasion. Phosphoric acid can cause skin injury.
	CHRONIC:	None known.
<u>INHALATION</u>	ACUTE:	Dust, if present, may cause upper respiratory irritation.
	CHRONIC:	Dust may cause lung damage if inhaled on a long-term basis.
<u>INGESTION</u>	ACUTE:	Unknown.
	CHRONIC:	Unknown.

FIRST AID PROCEDURES:

<u>EYES</u>	Immediately flush eyes with water for 15 minutes. Consult physician if irritation occurs.
<u>SKIN</u>	Wash with soap and water. Treat abrasions using normal first aid procedures.
<u>INHALATION</u>	Remove to fresh air. Seek medical attention.
<u>INGESTION</u>	Contact physician immediately. Do not induce vomiting unless instructed to do so by a physician.

=====

SECTION VI

REACTIVITY DATA

STABILITY: Stable

INCOMPATIBILITY: None known.

HAZARDOUS POLYMERIZATION: Will not occur.

=====

SECTION VII

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Sweep, shovel up, or pick up.

WASTE DISPOSAL METHOD: May be disposed of in an approved landfill, in accordance with local, state, and federal regulations.

=====

SECTION VIII

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Use NIOSH approved respirator when working around dried material or when removing this product after service.

VENTILATION: General mechanical ventilation is adequate.

EYE PROTECTION: Goggles or safety glasses with side shields should be worn.

OTHER PROTECTION: Use of leather gloves and long-sleeved and long-legged clothing protects hands, arms, and legs from skin contact or abrasion. Safety shoes should be worn to protect feet from accidentally dropped blocks of plastic.

=====

SECTION IX

SPECIAL PRECAUTIONS

Since this product contains phosphoric acid, toxic PO_x fumes can be formed on burn in.

Warning: This product contains crystalline silica. Prolonged exposure to dust may cause silicosis, a progressive pneumoconiosis, or other respiratory diseases. International Agency for Research on Cancer (IARC) has classified crystalline silica as a Class 2A carcinogen. Their study concluded that sufficient evidence for carcinogenicity exists in experimental animals and that limited evidence for carcinogenicity exists in humans.

NIOSH approved respirators should be worn any time that refractories are torn out after service. While some respiratory hazard and/or nuisance dust may exist from the product itself, other foreign substances may also be present as a result of use conditions. These foreign substances may warrant additional precautions during tearout and disposal.

This MSDS provides the toxic chemical "SUPPLIER INFORMATION" required under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR 372. Toxic chemical information, if applicable to the product(s) named, is located in Section II - HAZARDOUS INGREDIENTS section of the MSDS. This information is subject to the toxic chemical reporting requirements of Section 313 and must be included in all MSDSs that are copied and distributed for this product.

This material safety data sheet contains confidential proprietary information and is not to be disclosed to the general public or to competition except as required by law. The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with A. P. Green Industries, Inc. or not. This information is offered solely for use in your evaluation of this product in respect to safety, health, and environmental hazards.

Prepared By: Ellis J. Smith
Title: Senior Technical Consultant
Phone: (314) 473-3392

JH:\MSDS\CURRENT\GP85P.015

MATERIAL SAFETY DATA SHEET

5435

Date: 11/21/96

No. 5435

A. P. GREEN INDUSTRIES, INC.
GREEN BOULEVARD, MEXICO, MO 65265
EMERGENCY TELEPHONE NUMBER — 573-473-3626

SECTION I

PRODUCT NAME: ULTRA-GREEN 70
ULTRA-GREEN 70 Plus

PRODUCT TYPE: Castable Refractory

Canadian WHMIS Classification: D,2

NFPA Rating: 1-0-0

CHEMICAL FAMILY: SiO₂ = 23-26% Al₂O₃ = 69-73% **FORMULA:** Not Applicable
CaO = 1% Fe₂O₃ = 1-2%

SECTION II

PRODUCT HAZARDOUS INGREDIENTS

<u>CHEMICAL</u>	<u>TLV-TWA</u>	<u>CAS #</u>
Cristobalite (SiO ₂) (< 5 %)	0.05 mg/m ³ * Respirable Dust	14464-46-1
Quartz (SiO ₂) (< 2 %)	0.1 mg/m ³ * Respirable Dust	14808-60-7
Amorphous Silica (SiO ₂) (< 10 %)	2 mg/m ³ * Respirable Dust	69012-64-2
Alumina (Al ₂ O ₃) (< 10 %)	10 mg/m ³ * Total Dust	1344-28-1
Refractory Cement (< 10 %)	None (See Section IV)	12005-57-1

*Source: American Conference of Governmental Industrial Hygienists, 1995-1996.

SECTION III

HAZARDS INFORMATION

This product contains crystalline silica. Prolonged exposure to dust may cause silicosis, a progressive pneumoconiosis, or other respiratory diseases. International Agency for Research on Cancer (IARC) has classified crystalline silica as a Class 2A carcinogen. Their study concluded that sufficient evidence for carcinogenicity exists in experimental animals and that limited evidence for carcinogenicity exists in humans.

Dust from product at any stage of its use or during tear-out after service may, especially on long exposure, lead to lung disease unless respiratory protection is employed. NIOSH approved respirators should be worn any time that refractories are torn out after service. While a respiratory hazard and/or nuisance dust may exist from the product itself, other foreign substances may warrant additional precautions during tearout and disposal.

SECTION IV
FIRST AID MEASURES

EFFECT OF OVEREXPOSURE:

EYES: ACUTE: Dust can cause mechanical irritation. Product's cement can cause eye irritation.
CHRONIC: None Known

SKIN: ACUTE: Product's cement can cause skin irritation.
CHRONIC: None Known

INHALATION: ACUTE: Dust generated can cause breathing discomfort or irritation.
CHRONIC: Long-term exposure to dust may cause lung damage.

INGESTION: ACUTE: Unknown
CHRONIC: Unknown

FIRST AID MEASURES:

EYES: Flush with clean water for 15 minutes. If irritation occurs, consult physician.

SKIN: Wash with soap and water. If irritation occurs, consult physician.

INHALATION: Remove to fresh air. Seek medical attention.

INGESTION: Contact physician immediately. Do not induce vomiting unless instructed to do so by physician. Product is non-toxic as supplied, but its abrasive nature could damage internal organs.

SECTION V
FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES: None

EXTINGUISHING MEDIA: Not Combustible

FIRE FIGHTING INSTRUCTIONS: No special instructions.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

SECTION VI
ACCIDENTAL RELEASE MEASURES

SMALL/LARGE SPILL: If dry, predampen and sweep or shovel up. If wet (after mixing with water for use), sweep or shovel up and place in a container for disposal.

SECTION VII
HANDLING AND STORAGE

Store in a dry place. Product is non-flammable.

SECTION VIII
EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General mechanical ventilation is usually adequate (SECTION II).

RESPIRATORY PROTECTION: Use a NIOSH approved respirator when working around dried material and when removing this product after service.

EYE PROTECTION: Goggles or safety glasses with side shields should be worn.

SKIN PROTECTION: Gloves and long-sleeved and long-legged clothing should be worn to prevent skin contact.

OTHER: Safety shoes should be worn to prevent foot injury from accidentally dropped bags of castable.

SECTION IX
PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Gray, Granular Mixture		
BOILING POINT:	Not Applicable	pH:	9-11
SOLUBILITY IN WATER:	None	ODOR:	None
SPECIFIC GRAVITY:	3.2	MELTING POINT:	Not Applicable

SECTION X
STABILITY AND REACTIVITY

Product is stable under normal conditions of use, storage, and transportation.

Product can react with concentrated acids.

SECTION XI
TOXICOLOGICAL INFORMATION

LD₅₀ or LC₅₀ for oral, dermal, or inhalation routes of administration: no data for product.

SECTION XII
ECOLOGICAL INFORMATION

Ecotoxicological/chemical fate information: not available.

SECTION XIII
DISPOSAL CONSIDERATIONS

As supplied, product may be disposed of in an approved landfill, in accordance with federal, state, and local regulations.

Supplier can make no statement concerning disposal of used product, since product may become contaminated by hazardous materials during use.

SECTION XIV
TRANSPORT INFORMATION

U.S.A. DOT: Not Regulated
Canadian TDG Hazard Class & PIN: Not Regulated

SECTION XV
REGULATORY INFORMATION

TSCA Status: All Components Listed

Canadian DSL: All Components Listed

SARA Title III, Section 313: This MSDS provides the toxic chemical "SUPPLIER INFORMATION" required under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR 372. Toxic chemical information, if applicable to the product(s) named, is located in **Section II - HAZARDOUS INGREDIENTS** section of the MSDS. This information is subject to the toxic chemical reporting requirements of Section 313 and must be included in all MSDSs that are copied and distributed for this product.

SECTION XVI
OTHER INFORMATION

MSDS Status: New Format, Replaces MSDS Dated 2/18/93

Note: This material safety data sheet contains confidential proprietary information and is not to be disclosed to the general public or to competition except as required by law. The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with A. P. Green Industries, Inc. or not. This information is offered solely for use in your evaluation of this product in respect to safety, health, and environmental hazards.

Prepared By: Ellis J. Smith
Senior Technical Consultant
Phone: 573-473-3392

JH:\MSDS\CURRENT\UG70.116

MATERIAL SAFETY DATA SHEET

Date: 02/29/96

Nos. 1065

A. P. GREEN INDUSTRIES, INC.
GREEN BOULEVARD, MEXICO, MO 65265
EMERGENCY TELEPHONE NUMBER — 573-473-3626

SECTION I

PRODUCT NAME: MIZZOU[®] CASTABLE MIZZOU[®] GR
MIZZOU[®] CASTABLE Plus MIZZOU[®] GR Plus
MIZZOU[®] CASTABLE Supra MIZZOU[®] GR Supra
MIZZOU[®] CASTABLE Supra Plus MIZZOU[®] GR Supra Plus

PRODUCT TYPE: Castable Refractory

CHEMICAL FAMILY: SiO₂ = 29-36% Al₂O₃ = 57-63% **FORMULA:** Not Applicable
CaO = 2-4% Fe₂O₃ = 1-2%

SECTION II

PRODUCT HAZARDOUS INGREDIENTS

<u>CHEMICAL</u>	<u>TLV-TWA</u>	<u>CAS #</u>
Cristobalite (SiO ₂) (5-15%)	0.05 mg/m ³ * Respirable Dust	14464-46-1
Quartz (SiO ₂) (< 2%)	0.1 mg/m ³ * Respirable Dust	14808-60-7
Amorphous Silica (< 5%)	2 mg/m ³ * Respirable Dust	69012-64-2
Alumina (Al ₂ O ₃) (< 5%) **	10 mg/m ³ * Total Dust	1344-28-1
Refractory Cement (< 15%)	None (See Section V)	12005-57-1

*Source: American Conference of Governmental Industrial Hygienists, 1995-1996.

**MIZZOU[®] GR and MIZZOU[®] GR Plus only.

SECTION III

HAZARDS INFORMATION

This product contains crystalline silica. Prolonged exposure to dust may cause silicosis, a progressive pneumoconiosis, or other respiratory diseases. International Agency for Research on Cancer (IARC) has classified crystalline silica as a Class 2A carcinogen. Their study concluded that sufficient evidence for carcinogenicity exists in experimental animals and that limited evidence for carcinogenicity exists in humans.

Dust from product at any stage of its use or during tear-out after service may, especially on long exposure, lead to lung disease unless respiratory protection is employed. NIOSH approved respirators should be worn any time that refractories are torn out after service. While a respiratory hazard and/or nuisance dust may exist from the product itself, other foreign substances may warrant additional precautions during tearout and disposal.

SECTION IV **FIRST AID MEASURES**

EFFECT OF OVEREXPOSURE:

<u>EYES:</u>	ACUTE:	Dust can cause mechanical irritation. Product's cement can cause eye injury.
	CHRONIC:	None Known
<u>SKIN:</u>	ACUTE:	Product's cement can cause skin irritation.
	CHRONIC:	None Known
<u>INHALATION:</u>	ACUTE:	Dust generated can cause breathing discomfort or irritation.
	CHRONIC:	Long-term exposure to dust may cause lung damage.
<u>INGESTION:</u>	ACUTE:	Unknown
	CHRONIC:	Unknown

FIRST AID MEASURES:

EYES: Flush with clean water for 15 minutes. If irritation occurs, consult physician.

SKIN: Wash with soap and water. If irritation occurs, consult physician.

INHALATION: Remove to fresh air. Seek medical attention.

INGESTION: Contact physician immediately. Do not induce vomiting unless instructed to do so by physician. Product is non-toxic as supplied, but its abrasive nature could damage internal organs.

SECTION V **FIRE FIGHTING MEASURES**

FLAMMABLE PROPERTIES: None

EXTINGUISHING MEDIA: Not Combustible

FIRE FIGHTING INSTRUCTIONS: No special instructions.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

SECTION VI **ACCIDENTAL RELEASE MEASURES**

SMALL/LARGE SPILL: If dry, predampen and sweep or shovel up. If wet (after mixing with water for use), sweep or shovel up and place in a container for disposal.

SECTION VII
HANDLING AND STORAGE

Store in a dry place. Product is non-flammable.

SECTION VIII
EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General mechanical ventilation is usually adequate (SECTION II).

RESPIRATORY PROTECTION: Use a NIOSH approved respirator when working around dried material and when removing this product after service.

EYE PROTECTION: Goggles or safety glasses with side shields should be worn.

SKIN PROTECTION: Gloves and long-sleeved and long-legged clothing should be worn to prevent skin contact.

OTHER: Safety shoes should be worn to prevent foot injury from accidentally dropped bags of castable.

SECTION IX
PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Gray, Granular Mixture		
BOILING POINT:	Not Applicable	pH:	7-8
SOLUBILITY IN WATER:	None	ODOR:	None
SPECIFIC GRAVITY:	2.7	MELTING POINT:	Not Applicable

SECTION X
STABILITY AND REACTIVITY

Product is stable under normal conditions of use, storage, and transportation.

Product can react with concentrated acids.

SECTION XI
TOXICOLOGICAL INFORMATION

LD₅₀ or LC₅₀ for oral, dermal, or inhalation routes of administration: no data for product.

SECTION XII
ECOLOGICAL INFORMATION

Ecotoxicological/chemical fate information: not available.

SECTION XIII
DISPOSAL CONSIDERATIONS

As supplied, product may be disposed of in an approved landfill, in accordance with federal, state, and local regulations.

Supplier can make no statement concerning disposal of used product, since product may become contaminated by hazardous materials during use.

SECTION XIV
TRANSPORT INFORMATION

U.S.A. DOT: Not Regulated
Canadian TDG Hazard Class & PIN: Not Regulated

SECTION XV
REGULATORY INFORMATION

TSCA Status: All Components Listed
Canadian DSL: All Components Listed
SARA Title III, Section 313: This MSDS provides the toxic chemical "SUPPLIER INFORMATION" required under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR 372. Toxic chemical information, if applicable to the product(s) named, is located in **Section II - HAZARDOUS INGREDIENTS** section of the MSDS. This information is subject to the toxic chemical reporting requirements of Section 313 and must be included in all MSDSs that are copied and distributed for this product.

SECTION XVI
OTHER INFORMATION

MSDS Status: New format.

Note: This material safety data sheet contains confidential proprietary information and is not to be disclosed to the general public or to competition except as required by law. The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with A. P. Green Industries, Inc. or not. This information is offered solely for use in your evaluation of this product in respect to safety, health, and environmental hazards.

Prepared By: Ellis J. Smith
Senior Technical Consultant
Phone: 573-473-3392

JH:\MSDS\CURRENT\MC.026

MATERIAL SAFETY DATA SHEET

Date: 06/23/95

No. 5031, 6373
1194, 3907

A. P. GREEN INDUSTRIES, INC.
GREEN BOULEVARD, MEXICO, MO 65265
EMERGENCY TELEPHONE NUMBER — 314-473-3626

SECTION I

PRODUCT NAME: INSWOOL[®] Moldable GREEN 1F30
INSWOOL[®] Flowable GREEN 1F31

PRODUCT TYPE: Refractory Ceramic Fibers

CHEMICAL FAMILY: Not Applicable

FORMULA: Not Applicable

SECTION II

PRODUCT HAZARDOUS INGREDIENTS

<u>CHEMICAL</u>	<u>TLV-TWA</u>	<u>CAS #</u>
Refractory Ceramic Fiber (Al ₂ O ₃ -SiO ₂)	1 fiber/cc*	142844-00-6
Colloidal Silica (SiO ₂)	Amorphous Silica Dust 10 mg/m ^{3**} Total Dust	7631-86-9
Ethylene Glycol***	125 mg/m ^{3**} Ceiling Vapor	107-21-1

*A. P. Green workplace exposure guideline. See also Section III.

**Source: American Conference of Governmental Industrial Hygienists, 1994-1995.

***This product contains ethylene glycol, an ingredient listed in Section 313 of Title III of SARA and 40 CFR 372.65. For calculation purposes, ethylene glycol content of products on this MSDS is 5%.

SECTION III

HAZARDS INFORMATION

International Agency for Research on Cancer (IARC) has classified refractory ceramic fiber as 2B — possibly carcinogenic to humans.

As supplied, product contains no crystalline silica; however, when exposed to temperatures above 1800°F (982°C) during service, cristobalite, a form of crystalline silica, may form. Prolonged exposure to dust may cause silicosis, a progressive pneumoconiosis, or other respiratory diseases. International Agency for Research on Cancer (IARC) has classified crystalline silica as a Class 2A carcinogen. Its study concluded that sufficient evidence for carcinogenicity exists in experimental animals and that limited evidence for carcinogenicity exists in humans.

Dust from product at any stage of its use or during tear-out after service may, especially on long exposure, lead to lung disease unless respiratory protection is employed. NIOSH approved respirators should be worn any time that refractories are torn out after service. While a respiratory hazard and/or nuisance dust may exist from the product itself, other foreign substances may warrant additional precautions during tearout and disposal.

Contact between refractory ceramic fibers and skin may result in transitory skin rash. Susceptibility varies with individuals, with some individuals showing no susceptibility.

SECTION IV FIRST AID MEASURES

EFFECT OF OVEREXPOSURE:

<u>EYES:</u>	ACUTE:	Causes mechanical irritation.
	CHRONIC:	None Known
<u>SKIN:</u>	ACUTE:	May cause skin irritation.
	CHRONIC:	None Known
<u>INHALATION:</u>	ACUTE:	Dust generated can cause breathing discomfort.
	CHRONIC:	Long-term exposure to dust may cause lung damage.
<u>INGESTION:</u>	ACUTE:	Unknown
	CHRONIC:	Unknown

FIRST AID MEASURES:

EYES: Flush with clean water for 15 minutes. If irritation occurs, consult physician.

SKIN: Wash with soap and water. If irritation occurs, consult physician.

INHALATION: Remove to fresh air. Seek medical attention.

INGESTION: Contact physician immediately. Do not induce vomiting unless instructed to do so by physician. Product is non-toxic as supplied, but its abrasive nature could damage internal organs.

SECTION V FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES: Non-Flammable

EXTINGUISHING MEDIA: Not applicable for product.

FIRE FIGHTING INSTRUCTIONS: No special instructions.

SECTION VI ACCIDENTAL RELEASE MEASURES

SMALL/LARGE SPILL: Dampen, then pick up or scoop up and place in a container for disposal.

SECTION VII HANDLING AND STORAGE

Store in a dry place, away from extreme heat. Product is non-flammable, but packaging is combustible.

SECTION VIII
EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Use adequate ventilation to meet exposure controls (SECTION II).

RESPIRATORY PROTECTION: Use a NIOSH approved respirator for mineral dusts when working with this product.

EYE PROTECTION: Use safety glasses with side shields to avoid eye contact.

SKIN PROTECTION: Wear impervious gloves and long-sleeved clothing to avoid skin contact. Cleanse exposed skin after any contact.

OTHER: Wash work clothing separately; rinse washing machine thoroughly after use.

SECTION IX
PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	White to off-white fiber, prepared in the form of a moldable paste, with no odor.		
BOILING POINT:	Not Applicable	pH:	7
SOLUBILITY IN WATER:	None	ODOR:	None
SPECIFIC GRAVITY:	2.2	MELTING POINT:	Not Applicable

SECTION X
STABILITY AND REACTIVITY

Product is stable under normal conditions of use, storage, and transportation.

Product can react with concentrated acids.

SECTION XI
TOXICOLOGICAL INFORMATION

LD₅₀ or LC₅₀ for oral, dermal, or inhalation routes of administration: no data for product.

SECTION XII
ECOLOGICAL INFORMATION

Ecotoxicological/chemical fate information: not available.

SECTION XIII
DISPOSAL CONSIDERATIONS

As supplied, product may be disposed of in an approved landfill, in accordance with federal, state, and local regulations.

Supplier can make no statement concerning disposal of used product, since product may become contaminated by hazardous materials during use.

SECTION XIV
TRANSPORT INFORMATION

U.S.A. DOT: Not Regulated
Canadian TDG Hazard Class & PIN: Not Regulated

SECTION XV
REGULATORY INFORMATION

TSCA Status: All Components Listed
Canadian DSL: All Components Listed
SARA Title III, Section 313: This MSDS provides the toxic chemical "SUPPLIER INFORMATION" required under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR 372. Toxic chemical information, if applicable to the product(s) named, is located in Section II - HAZARDOUS INGREDIENTS section of the MSDS. This information is subject to the toxic chemical reporting requirements of Section 313 and must be included in all MSDSs that are copied and distributed for this product.

SECTION XVI
OTHER INFORMATION

MSDS Status: New format, replaces MSDS Dated 1/28/93.

Note: This material safety data sheet contains confidential proprietary information and is not to be disclosed to the general public or to competition except as required by law. The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with A. P. Green Industries, Inc. or not. This information is offered solely for use in your evaluation of this product in respect to safety, health, and environmental hazards.

Prepared By: Ellis J. Smith
Senior Technical Consultant
Phone: 314-473-3392

JH:\MSDS\CURRENT\IWM.065

MATERIAL SAFETY DATA SHEET

Date: 01/26/98

Nos. 3297
3904, 3102

A. P. GREEN REFRACTORIES, INC.
and Subsidiaries
GREEN BOULEVARD, MEXICO, MO 65265

Emergency Telephone Number — Call 573-473-3626
Transportation Emergencies — Contact CHEMTREC at 800-424-9300
International Emergencies — Contact CHEMTREC at 703-527-3887
Health Emergencies — Contact Your Local Poison Center

SECTION I

PRODUCT NAME:	INSWOOL [®] BLANKET	INSWOOL [®] BULK
	INSWOOL [®] -HP BLANKET	INSWOOL [®] -HP BULK
	INSWOOL [®] -HP-M BLANKET*	INSWOOL [®] -HP-M BULK*
	INSWOOL [®] -HT BLANKET	INSWOOL [®] -HT BULK
	INSWOOL [®] -HT-M BLANKET*	INSWOOL [®] -HT-M BULK*
	INSWOOL [®] -LT BLANKET	INSWOOL [®] -LT BULK
	INSWOOL [®] -LT-M BLANKET*	INSWOOL [®] -LT-M BULK*
	INSWOOL -M BLANKET	INSWOOL [®] -M BULK
		INSWOOL MODULE BE-104

PRODUCT TYPE: Refractory Ceramic Fiber Blanket or Bulk

Canadian WHMIS Classification: D,2

NFPA Rating: 1-0-0

CHEMICAL FAMILY: Not Applicable

FORMULA: Not Applicable

*Manufactured in the Republic of Mexico.

SECTION II PRODUCT HAZARDOUS INGREDIENTS

<u>CHEMICAL</u>	<u>TLV-TWA</u>	<u>CAS #</u>
Refractory Ceramic Fiber (Al ₂ O ₃ -SiO ₂) (100%)	1 fiber/cc*	142844-00-6

*A. P. Green workplace exposure guideline. See also Section III.

SECTION III HAZARDS INFORMATION

American Conference of Governmental Industrial Hygienists (ACGIH) is proposing a TLV-TWA of 0.1 to 0.5 fibers/cc for Refractory Ceramic Fiber.

International Agency for Research on Cancer (IARC) has classified Refractory Ceramic Fiber as 2B — possibly carcinogenic to humans.

As supplied, product contains no crystalline silica; however, when exposed to temperatures above 1800°F (982°C) during service, cristobalite, a form of crystalline silica, may form. Prolonged exposure to dust may cause silicosis, a progressive pneumoconiosis, or other respiratory diseases. International Agency for Research on Cancer (IARC) has classified crystalline silica as Group 1. The agency states there is sufficient evidence of carcinogenicity in humans. Reference: IARC Monograph 68.

Dust from product at any stage of its use or during tear-out after service may, especially on long exposure, lead to lung disease unless respiratory protection is employed. NIOSH approved respirators should be worn any time that refractories are torn out after service. While a respiratory hazard and/or nuisance dust may exist from the product itself, other foreign substances may warrant additional precautions during tearout and disposal.

Contact between refractory ceramic fibers and skin may result in transitory skin rash. Susceptibility varies with individuals, with some individuals showing no susceptibility.

SECTION IV **FIRST AID MEASURES**

EFFECT OF OVEREXPOSURE:

<u>EYES:</u>	ACUTE:	Causes mechanical irritation.
	CHRONIC:	None Known
<u>SKIN:</u>	ACUTE:	May cause skin irritation.
	CHRONIC:	None Known
<u>INHALATION:</u>	ACUTE:	Dust generated can cause breathing discomfort.
	CHRONIC:	Long-term exposure to dust may cause lung damage.
<u>INGESTION:</u>	ACUTE:	Unknown
	CHRONIC:	Unknown

FIRST AID MEASURES:

EYES: Flush with clean water for 15 minutes. If irritation occurs, consult physician.

SKIN: Wash with soap and water. If irritation occurs, consult physician.

INHALATION: Remove to fresh air. Seek medical attention.

INGESTION: Contact physician immediately. Do not induce vomiting unless instructed to do so by physician. Product is non-toxic as supplied, but its abrasive nature could damage internal organs.

SECTION V **FIRE FIGHTING MEASURES**

FLAMMABLE PROPERTIES: Non-Flammable

EXTINGUISHING MEDIA: Not applicable for product.

FIRE FIGHTING INSTRUCTIONS: No special instructions.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

SECTION VI
ACCIDENTAL RELEASE MEASURES

SMALL/LARGE SPILL: Dampen, then pick up or scoop up and place in a container for disposal.

SECTION VII
HANDLING AND STORAGE

Store in a dry place, away from extreme heat. Product is non-flammable, but packaging is combustible.

SECTION VIII
EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Use adequate ventilation to meet exposure controls (SECTION II).

RESPIRATORY PROTECTION: Use a NIOSH approved respirator for mineral dusts when working with this product.

EYE PROTECTION: Use safety glasses with side shields to avoid eye contact.

SKIN PROTECTION: Wear impervious gloves and long-sleeved clothing to avoid skin contact. Cleanse exposed skin after any contact.

OTHER: Wash work clothing separately; rinse washing machine thoroughly after use.

SECTION IX
PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	White to Off-White Fiber, in Blanket or Bulk Form		
BOILING POINT:	Not Applicable	pH:	7
SOLUBILITY IN WATER:	None	ODOR:	None
SPECIFIC GRAVITY:	Not Applicable	MELTING POINT:	Not Applicable

SECTION X
STABILITY AND REACTIVITY

Product is stable under normal conditions of use, storage, and transportation.

Product can react with concentrated acids.

SECTION XI
TOXICOLOGICAL INFORMATION

LD₅₀ or LC₅₀ for oral, dermal, or inhalation routes of administration: no data for product.

SECTION XII
ECOLOGICAL INFORMATION

Ecotoxicological/chemical fate information: not available.

SECTION XIII
DISPOSAL CONSIDERATIONS

As supplied, product may be disposed of in an approved landfill, in accordance with federal, state, and local regulations.

Supplier can make no statement concerning disposal of used product, since product may become contaminated by hazardous materials during use.

SECTION XIV
TRANSPORT INFORMATION

U.S.A. DOT: Not Regulated
Canadian TDG Hazard Class & PIN: Not Regulated

SECTION XV
REGULATORY INFORMATION

TSCA Status: All Components Listed

Canadian DSL: All Components Listed

SARA Title III, Section 313: This MSDS provides the toxic chemical "SUPPLIER INFORMATION" required under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR 372. Toxic chemical information, if applicable to the product(s) named, is located in **Section II - HAZARDOUS INGREDIENTS** section of the MSDS. This information is subject to the toxic chemical reporting requirements of Section 313 and must be included in all MSDSs that are copied and distributed for this product.

SECTION XVI
OTHER INFORMATION

MSDS Status: Replaces MSDS Dated 08/01/97

Note: This material safety data sheet contains confidential proprietary information and is not to be disclosed to the general public or to competition except as required by law. The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with A. P. Green Refractories, Inc. or not. This information is offered solely for use in your evaluation of this product in respect to safety, health, and environmental hazards.

Prepared By: Ellis J. Smith
Senior Technical Consultant
Phone: 573-473-3392

MATERIAL SAFETY DATA SHEET 5077

Date: 12/26/97

No. 5077

A. P. GREEN INDUSTRIES, INC.
GREEN BOULEVARD, MEXICO, MO 65265

APGI Emergency Telephone Number — Call 573-473-3626
Transportation Emergencies — Contact CHEMTREC at 800-424-9300
International Emergencies — Contact CHEMTREC at 703-527-3887
Health Emergencies — Contact Your Local Poison Center

SECTION I

PRODUCT NAME: No. 36 REFRACTORY CEMENT

PRODUCT TYPE: Refractory Mortar

Canadian WHMIS Classification: D,2

NFPA Rating: 1-0-0

CHEMICAL FAMILY: SiO_2 = 23-27% Al_2O_3 = 65-69% FORMULA: Not Applicable
 Fe_2O_3 = 1-2% NaKO = 2-3%

SECTION II

PRODUCT HAZARDOUS INGREDIENTS

<u>CHEMICAL</u>	<u>TLV-TWA</u>	<u>CAS #</u>
Cristobalite (SiO_2) (< 8%)	0.05 mg/m ³ * Respirable Dust	14464-46-1
Quartz (SiO_2) (< 5%)	0.1 mg/m ³ * Respirable Dust	14808-60-7
Liquid Sodium Silicate (15-22%)	None	1344-09-8

*Source: American Conference of Governmental Industrial Hygienists, 1997.

SECTION III

HAZARDS INFORMATION

This product contains crystalline silica. Prolonged exposure to dust may cause silicosis, a progressive pneumoconiosis, or other respiratory diseases. International Agency for Research on Cancer (IARC) has classified crystalline silica as Group 1. The agency states there is sufficient evidence of carcinogenicity in humans. Reference: IARC Monograph 68.

Dust from product at any stage of its use or during tear-out after service may, especially on long exposure, lead to lung disease unless respiratory protection is employed. NIOSH approved respirators should be worn any time that refractories are torn out after service. While a respiratory hazard and/or nuisance dust may exist from the product itself, other foreign substances may warrant additional precautions during tearout and disposal.

SECTION IV
FIRST AID MEASURES

EFFECT OF OVEREXPOSURE:

EYES: ACUTE: Dust or aggregate can cause mechanical irritation. Liquid sodium silicate can cause eye injury or irritation.
CHRONIC: None Known

SKIN: ACUTE: Can cause mechanical abrasion. Liquid sodium silicate can cause skin drying and chapping.
CHRONIC: None Known

INHALATION: ACUTE: Dust, if present, can cause upper respiratory irritation.
CHRONIC: Long-term exposure to dust may cause lung damage.

INGESTION: ACUTE: Unknown
CHRONIC: Unknown

FIRST AID MEASURES:

EYES: Flush with clean water for 15 minutes. Obtain prompt medical attention

SKIN: Wash with soap and water. Seek medical attention if irritation occurs.

INHALATION: Remove to fresh air. Seek medical attention.

INGESTION: Contact physician immediately. Do not induce vomiting unless instructed to do so by physician. Product is non-toxic as supplied, but its abrasive nature could damage internal organs.

SECTION V
FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES: None

EXTINGUISHING MEDIA: Not Combustible

FIRE FIGHTING INSTRUCTIONS: No special instructions.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

SECTION VI
ACCIDENTAL RELEASE MEASURES

SMALL/LARGE SPILL: Sweep or shovel up and place in a container for disposal.

SECTION VII
HANDLING AND STORAGE

Store in a dry place. Product is non-flammable.

SECTION VIII
EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General mechanical ventilation is usually adequate (SECTION II).

RESPIRATORY PROTECTION: Use a NIOSH approved respirator when working around dried material and when removing this product after service.

EYE PROTECTION: Goggles or safety glasses with side shields should be worn.

SKIN PROTECTION: Rubber gloves and long-sleeved and long-legged clothing should be worn to prevent skin contact.

OTHER: Safety shoes should be worn to prevent foot injury from accidentally dropped containers of mortar.

SECTION IX
PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Buff to Gray Granular Paste		
BOILING POINT:	Not Applicable	pH:	10-11
SOLUBILITY IN WATER:	None	ODOR:	None
SPECIFIC GRAVITY:	2.2	MELTING POINT:	Not Applicable

SECTION X
STABILITY AND REACTIVITY

Product is stable under normal conditions of use, storage, and transportation.

Product can react with concentrated acids.

SECTION XI
TOXICOLOGICAL INFORMATION

LD₅₀ or LC₅₀ for oral, dermal, or inhalation routes of administration: no data for product.

SECTION XII
ECOLOGICAL INFORMATION

Ecotoxicological/chemical fate information: not available.

SECTION XIII
DISPOSAL CONSIDERATIONS

As supplied, product may be disposed of in an approved landfill, in accordance with federal, state, and local regulations.

Supplier can make no statement concerning disposal of used product, since product may become contaminated by hazardous materials during use.

SECTION XIV
TRANSPORT INFORMATION

U.S.A. DOT: Not Regulated
Canadian TDG Hazard Class & PIN: Not Regulated

SECTION XV
REGULATORY INFORMATION

TSCA Status: All Components Listed
Canadian DSL: All Components Listed

SARA Title III, Section 313: This MSDS provides the toxic chemical "SUPPLIER INFORMATION" required under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR 372. Toxic chemical information, if applicable to the product(s) named, is located in **Section II - HAZARDOUS INGREDIENTS** section of the MSDS. This information is subject to the toxic chemical reporting requirements of Section 313 and must be included in all MSDSs that are copied and distributed for this product.

SECTION XVI
OTHER INFORMATION

MSDS Status: Replaces MSDS Dated 05/02/97

Note: This material safety data sheet contains confidential proprietary information and is not to be disclosed to the general public or to competition except as required by law. The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with A. P. Green Industries, Inc. or not. This information is offered solely for use in your evaluation of this product in respect to safety, health, and environmental hazards.

Prepared By: Ellis J. Smith
Senior Technical Consultant
Phone: 573-473-3392

JH:\MSDS\CURRENT\N36RC.127

MATERIAL SAFETY DATA SHEET

Date: 11/14/97

22
No. 22

A. P. GREEN INDUSTRIES, INC.
GREEN BOULEVARD, MEXICO, MO 65265

APGI Emergency Telephone Number — Call 573-473-3626
Transportation Emergencies — Contact CHEMTREC at 800-424-9300
International Emergencies — Contact CHEMTREC at 703-527-3887
Health Emergencies — Contact Your Local Poison Center

SECTION I

PRODUCT NAME: KAST-O-LITE® 30 KAST-O-LITE® 30 GR
KAST-O-LITE 30 Plus KAST-O-LITE 30 GR Plus

PRODUCT TYPE: Castable Refractory

Canadian WHMIS Classification: D,2

NFPA Rating: 1-0-0

CHEMICAL FAMILY: SiO₂ = 32-35% Al₂O₃ = 58-61% **FORMULA:** Not Applicable
CaO = 4-5% Fe₂O₃ = 2%

SECTION II

PRODUCT HAZARDOUS INGREDIENTS

<u>CHEMICAL</u>	<u>TLV-TWA</u>	<u>CAS #</u>
Cristobalite (SiO ₂) (5-15%)	0.05 mg/m ³ * Respirable Dust	14464-46-1
Quartz (SiO ₂) (<2%)	0.1 mg/m ³ * Respirable Dust	14808-60-7
Alumina (Al ₂ O ₃) (<5%)	10 mg/m ³ * Total Dust	1344-28-1
Refractory Cement (20-30%)	None (See Section IV)	12005-57-1

*Source: American Conference of Governmental Industrial Hygienists, 1996.

SECTION III

HAZARDS INFORMATION

This product contains crystalline silica. Prolonged exposure to dust may cause silicosis, a progressive pneumoconiosis, or other respiratory diseases. International Agency for Research on Cancer (IARC) has classified crystalline silica as Group 1. The agency states there is sufficient evidence of carcinogenicity in humans. Reference: IARC Monograph 68.

Dust from product at any stage of its use or during tear-out after service may, especially on long exposure, lead to lung disease unless respiratory protection is employed. NIOSH approved respirators should be worn any time that refractories are torn out after service. While a respiratory hazard and/or nuisance dust may exist from the product itself, other foreign substances may warrant additional precautions during tearout and disposal.

SECTION IV
FIRST AID MEASURES

EFFECT OF OVEREXPOSURE:

EYES: ACUTE: Dust can cause mechanical irritation. Product's cement can cause eye irritation.
CHRONIC: None Known

SKIN: ACUTE: Product's cement can cause skin irritation.
CHRONIC: None Known

INHALATION: ACUTE: Dust generated can cause breathing discomfort or irritation.
CHRONIC: Long-term exposure to dust may cause lung damage.

INGESTION: ACUTE: Unknown
CHRONIC: Unknown

FIRST AID MEASURES:

EYES: Flush with clean water for 15 minutes. If irritation occurs, consult physician.

SKIN: Wash with soap and water. If irritation occurs, consult physician.

INHALATION: Remove to fresh air. Seek medical attention.

INGESTION: Contact physician immediately. Do not induce vomiting unless instructed to do so by physician. Product is non-toxic as supplied, but its abrasive nature could damage internal organs.

SECTION V
FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES: None

EXTINGUISHING MEDIA: Not Combustible

FIRE FIGHTING INSTRUCTIONS: No special instructions.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

SECTION VI
ACCIDENTAL RELEASE MEASURES

SMALL/LARGE SPILL: If dry, predampen and sweep or shovel up. If wet (after mixing with water for use), sweep or shovel up and place in a container for disposal.

SECTION VII
HANDLING AND STORAGE

Store in a dry place. Product is non-flammable.

SECTION VIII
EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General mechanical ventilation is usually adequate (SECTION II).

RESPIRATORY PROTECTION: Use a NIOSH approved respirator when working around dried material and when removing this product after service.

EYE PROTECTION: Goggles or safety glasses with side shields should be worn.

SKIN PROTECTION: Gloves and long-sleeved and long-legged clothing should be worn to prevent skin contact.

OTHER: Safety shoes should be worn to prevent foot injury from accidentally dropped bags of castable.

SECTION IX
PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Gray, Granular Mixture		
BOILING POINT:	Not Applicable	pH:	10-11
SOLUBILITY IN WATER:	None	ODOR:	None
SPECIFIC GRAVITY:	1.0	MELTING POINT:	Not Applicable

SECTION X
STABILITY AND REACTIVITY

Product is stable under normal conditions of use, storage, and transportation.

Product can react with concentrated acids.

SECTION XI
TOXICOLOGICAL INFORMATION

LD₅₀ or LC₅₀ for oral, dermal, or inhalation routes of administration: no data for product.

SECTION XII
ECOLOGICAL INFORMATION

Ecotoxicological/chemical fate information: not available.

SECTION XIII
DISPOSAL CONSIDERATIONS

As supplied, product may be disposed of in an approved landfill, in accordance with federal, state, and local regulations.

Supplier can make no statement concerning disposal of used product, since product may become contaminated by hazardous materials during use.

SECTION XIV
TRANSPORT INFORMATION

U.S.A. DOT: Not Regulated
Canadian TDG Hazard Class & PIN: Not Regulated

SECTION XV
REGULATORY INFORMATION

TSCA Status: All Components Listed

Canadian DSL: All Components Listed

SARA Title III, Section 313: This MSDS provides the toxic chemical "SUPPLIER INFORMATION" required under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR 372. Toxic chemical information, if applicable to the product(s) named, is located in **Section II - HAZARDOUS INGREDIENTS** section of the MSDS. This information is subject to the toxic chemical reporting requirements of Section 313 and must be included in all MSDSs that are copied and distributed for this product.

SECTION XVI
OTHER INFORMATION

MSDS Status: Replaces MSDS Dated 04/04/97

Note: This material safety data sheet contains confidential proprietary information and is not to be disclosed to the general public or to competition except as required by law. The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with A. P. Green Industries, Inc. or not. This information is offered solely for use in your evaluation of this product in respect to safety, health, and environmental hazards.

Prepared By: Ellis J. Smith
Senior Technical Consultant
Phone: 573-473-3392

JH:\MSDS\CURRENT\KOL30.117

MATERIAL SAFETY DATA SHEET

Date: 02/11/97

No. 5116

A. P. GREEN INDUSTRIES, INC.
GREEN BOULEVARD, MEXICO, MO 65265
EMERGENCY TELEPHONE NUMBER — 573-473-3626

SECTION I

PRODUCT NAME: SUPER G[®] SUPER G[®] J
SUPER G[®] Plus SUPER G[®] J Plus

PRODUCT TYPE: Plastic Refractory

Canadian WHMIS Classification: D,2

NFPA Rating: 1-0-0

CHEMICAL FAMILY: SiO₂ = 43-46% Al₂O₃ = 49-52% **FORMULA:** Not Applicable
Fe₂O₃ = 1-3% TiO₂ = 1-3%
NaKO = 1%

SECTION II

PRODUCT HAZARDOUS INGREDIENTS

<u>CHEMICAL</u>	<u>TLV-TWA</u>	<u>CAS #</u>
Cristobalite (SiO ₂) (3-10%)	0.05 mg/m ³ * Respirable Dust	14464-46-1
Quartz (SiO ₂) (1-4%)	0.1 mg/m ³ * Respirable Dust	14808-60-7

*Source: American Conference of Governmental Industrial Hygienists, 1996.

SECTION III

HAZARDS INFORMATION

This product contains crystalline silica. Prolonged exposure to dust may cause silicosis, a progressive pneumoconiosis, or other respiratory diseases. International Agency for Research on Cancer (IARC) has classified crystalline silica as a Class 2A carcinogen. Their study concluded that sufficient evidence for carcinogenicity exists in experimental animals and that limited evidence for carcinogenicity exists in humans.

Dust from product at any stage of its use or during tear-out after service may, especially on long exposure, lead to lung disease unless respiratory protection is employed. NIOSH approved respirators should be worn any time that refractories are torn out after service. While a respiratory hazard and/or nuisance dust may exist from the product itself, other foreign substances may warrant additional precautions during tearout and disposal.

SECTION IV

FIRST AID MEASURES

EFFECT OF OVEREXPOSURE:

EYES: ACUTE: Dust or aggregate can cause mechanical irritation. Phosphoric acid can cause eye injury.
CHRONIC: None Known

SKIN: ACUTE: Can cause mechanical abrasion.
CHRONIC: None Known

INHALATION: ACUTE: Dust, if present, can cause upper respiratory irritation.
CHRONIC: Long-term exposure to dust may cause lung damage.

INGESTION: ACUTE: Unknown
CHRONIC: Unknown

FIRST AID MEASURES:

EYES: Flush with clean water for 15 minutes. Promptly, consult physician.

SKIN: Promptly wash with soap and water. If irritation occurs, consult physician.

INHALATION: Remove to fresh air. Seek medical attention.

INGESTION: Contact physician immediately. Do not induce vomiting unless instructed to do so by physician. Product is non-toxic as supplied, but its abrasive nature could damage internal organs.

SECTION V
FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES: None

EXTINGUISHING MEDIA: Not Combustible

FIRE FIGHTING INSTRUCTIONS: No special instructions.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

SECTION VI
ACCIDENTAL RELEASE MEASURES

SMALL/LARGE SPILL: Sweep, shovel up, or pick up and place in a container for disposal.

SECTION VII
HANDLING AND STORAGE

Store in a dry place. Product is non-flammable.

SECTION VIII
EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General mechanical ventilation is usually adequate (SECTION II).

RESPIRATORY PROTECTION: Use a NIOSH approved respirator when working around dried material and when removing this product after service.

EYE PROTECTION: Goggles or safety glasses with side shields should be worn.

SKIN PROTECTION: Leather gloves and long-sleeved and long-legged clothing should be worn to prevent skin contact.

OTHER: Safety shoes should be worn to prevent foot injury from accidentally dropped containers of product.

SECTION IX
PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Buff to gray Granular Solid		
BOILING POINT:	Not Applicable	pH:	Not Applicable
SOLUBILITY IN WATER:	None	ODOR:	None
SPECIFIC GRAVITY:	2.6	MELTING POINT:	Not Applicable

SECTION X
STABILITY AND REACTIVITY

Product is stable under normal conditions of use, storage, and transportation.

Product can react with concentrated acids.

SECTION XI
TOXICOLOGICAL INFORMATION

LD₅₀ or LC₅₀ for oral, dermal, or inhalation routes of administration: no data for product.

SECTION XII
ECOLOGICAL INFORMATION

Ecotoxicological/chemical fate information: not available.

SECTION XIII
DISPOSAL CONSIDERATIONS

As supplied, product may be disposed of in an approved landfill, in accordance with federal, state, and local regulations.

Supplier can make no statement concerning disposal of used product, since product may become contaminated by hazardous materials during use.

SECTION XIV
TRANSPORT INFORMATION

U.S.A. DOT:	Not Regulated
Canadian TDG Hazard Class & PIN:	Not Regulated

SECTION XV
REGULATORY INFORMATION

TSCA Status: All Components Listed
Canadian DSL: All Components Listed

SARA Title III, Section 313: This MSDS provides the toxic chemical "SUPPLIER INFORMATION" required under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR 372. Toxic chemical information, if applicable to the product(s) named, is located in **Section II - HAZARDOUS INGREDIENTS** section of the MSDS. This information is subject to the toxic chemical reporting requirements of Section 313 and must be included in all MSDSs that are copied and distributed for this product.

SECTION XVI
OTHER INFORMATION

MSDS Status: New format, Replaces MSDS Dated 01/03/94

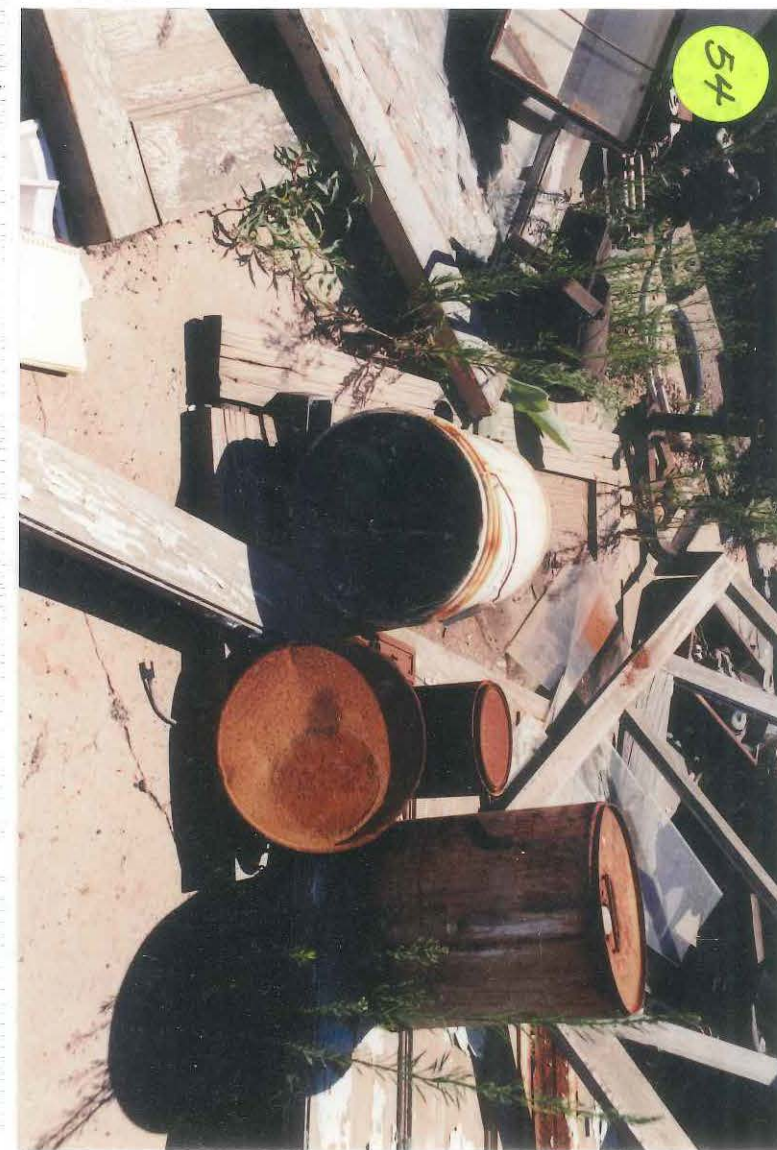
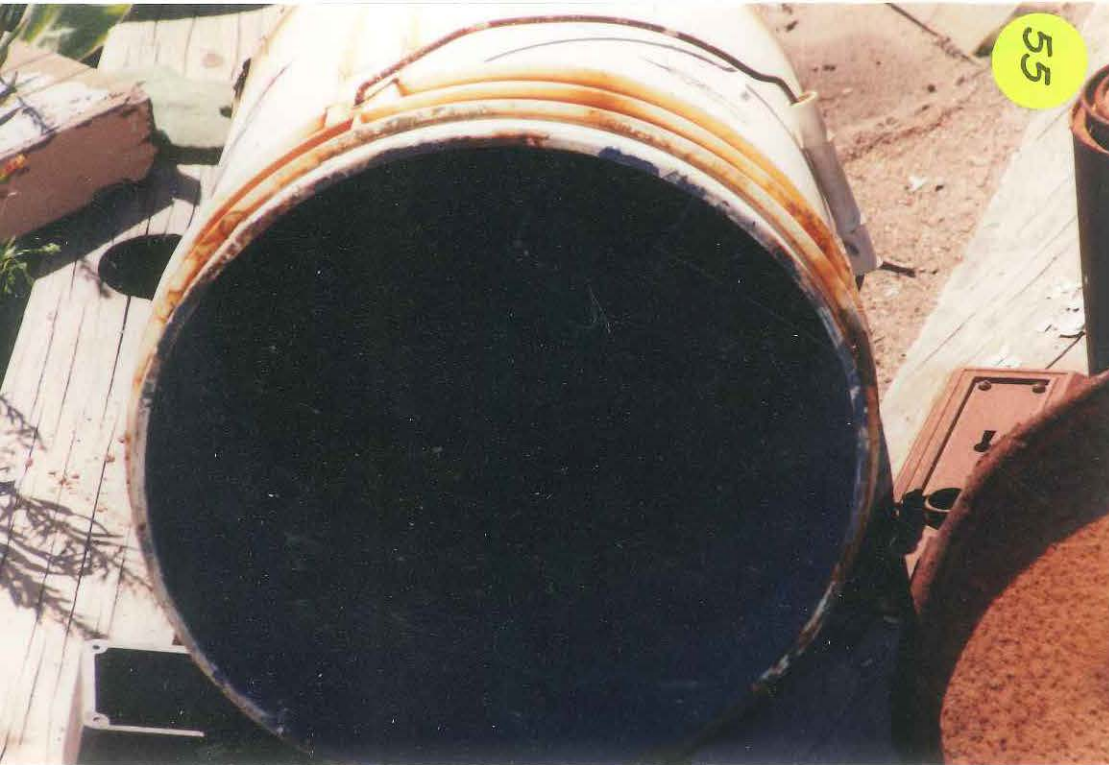
Note: This material safety data sheet contains confidential proprietary information and is not to be disclosed to the general public or to competition except as required by law. The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with A. P. Green Industries, Inc. or not. This information is offered solely for use in your evaluation of this product in respect to safety, health, and environmental hazards.

Prepared By: Ellis J. Smith
Senior Technical Consultant
Phone: 573-473-3392

JH:\MSDS\CURRENT\SG.027

D





Sheffield - Joliet Photos of 1 and 5 gallon containers
Refractory Brick Pile East Side of Facility
Photos 5, 8, August 18, 1999
EPA Photos 10 & 13

57





80000 SERIES

10% P.C.W.



Esr. 1965

ARRO Laboratory, Inc.

P.O. Box 686 Caton Farm Road
Joliet, Illinois 60434

Phone: 815-727-5436

FAX 815-740-3234

Attention of: MR. TOM FURDETTE
Company: SHEFFIELD STEEL CORPORATION
Address: PO BOX 727
City/State/Zip: JOLIET IL 60434-0727

P.O. Number 6282
Date Received 05/07/97
Date Completed 05/22/97

ARRO NO.	SAMPLE DESCRIPTION	DATE
188964	MILL SCALE	05/07/97

EPA SOLID WASTE REQUIREMENTS

ANALYSIS	AS RECEIVED ug/gm	TCLP EXTRACT mg/l
ARSENIC		<2. 05/20/97 SC
CADMIUM		<1. 05/14/97 SC
CHROMIUM, TOTAL		<1. 05/16/97 SC
LEAD		<1. 05/19/97 SC
MERCURY, ppb		<0.5 05/21/97 SR
BARIUM		<1. 05/16/97 SC
SELENIUM		<1. 05/20/97 SC
SILVER		<1. 05/15/97 SC

RESULTS IN mg/l UNLESS OTHERWISE INDICATED

* SEE ATTACHMENT FOR COMMENTS

I CERTIFY THAT I AM FAMILIAR WITH THE INFORMATION CONTAINED IN THIS REPORT AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF SUCH INFORMATION IS TRUE, COMPLETE AND ACCURATE.

APPROVED BY Joan Serdar DATE 05/27/97
Joan Serdar, Director
Environmental Services

TESTING IS IN ACCORDANCE WITH PROCEDURES OUTLINED IN THE NEWEST EDITIONS OF:
THE FEDERAL REGISTER, SW-846

MATERIAL SAFETY DATA SHEET

I GENERAL INFORMATION

Identity: STEEL MILL SCALE Revision 3
Synonyms: Date: January 2, 1998
Family: Inorganic Compounds MSDS #MSDSSCALE.02

Manufacturer's Name: Sheffield Steel Corporation
Manufacturer's Address: 1 Industry Avenue
Joliet, Illinois 60434

Information Telephone Number: (815) 723-9335
Emergency Telephone Number: (815) 723-9335

II HAZARDOUS CONSTITUENTS

Scale may contain the following:

Constituent	OSHA PEL (mg/m ³)	ACGIH TLV (mg/m ³)	% (Range)	CAS #
Iron ^a	10 ^b	5	50-99	1309-37-1 ^a
Calcium	-	-	0-50	---
Aluminum	15 ^b , 5 ^c	10	0-10	7429-90-5
Manganese ^d	1	1	0-5	7439-96-5 ^d
Arsenic	0.5 ^e	0.2	0-1	7440-38-2
Cadmium ^f	0.1	0.05 ^g	0-1	1306-19-0 ^f
Chromium	1	0.5	0-1	7440-47-3
Copper ^h	0.1	0.2	0-1	7440-50-8 ^h
Lead ⁱ	0.05	0.15	0-1	7439-92-1 ^f
Nickel	1	1	0-1	7440-02-0
Potassium	-	-	0-1	7440-09-7
Sulfur	-	-	0-1	7704-34-9
Titanium	10 ^{b,i} , 5 ^{c,j}	10	0-1	13463-67-7 ^j
Tungsten ^k	1	1	0-1	---
Zinc	5 ^l	5 ^l	0-1	1314-13-2 ^h

Notes: (a) Fume, as Fe (g) Ceiling
(b) Total Dust (h) Fume
(c) Respirable Fraction (i) Inorganic Dusts and Fumes, as Pb
(d) Fume, as Mn (j) Titanium Dioxide
(e) Inorganic Compounds (k) Soluble Compounds
(f) Fume, as Cd (l) Zinc Oxide Fume

Many substances do not have a unique exposure limit. The absence of it does not lessen consideration for exposure risk. In the absence of specific information professional judgment may be required.

III PHYSICAL AND CHEMICAL CHARACTERISTICS

Boiling Point: ±5000 °F Melting Point: ±2500 °F
Vapor Pressure: N/A Specific Gravity (H₂O = 1) 7.8-8.2
(mm Hg)
Vapor Density: N/A Evaporation Rate: N/A
(Air = 1) (Butyl Acetate = 1)
Solubility in: Insoluble
Water
Appearance and Odor: Black metal, odorless, mainly consists of small particles or chips

IV PHYSICAL AND CHEMICAL HAZARDS

Flash Point: Not Flammable LEL: N/A
Extinguishing Media: N/A UEL: N/A
Special Fire Fighting Procedures: N/A
Unusual Fire and Explosion Hazards: N/A

V REACTIVITY DATA

Stability: Stable Conditions to avoid: N/A

Incompatibility: Reacts with strong acids to liberate explosive hydrogen gas.

Hazardous decomposition or byproducts: Metallic oxides or metal fumes may be produced during melting operations.

VI HEALTH HAZARD DATA

Routes of Entry Inhalation: Yes
 Skin: No
 Ingestion: Yes

Health Hazards:

Acute: Inhalation of fumes may result in chills and fever for 12 to 48 hours. Metal fume fever - metallic taste, throat irritation and flu-like symptoms.

Chronic: Chromium, manganese and nickel fumes may cause lung disease, lead fumes can damage kidneys and affect muscle strength.

Carcinogenic: NTP: Arsenic, nickel, chromium, cadmium
IARC: Arsenic, nickel, chromium, cadmium, lead
OSHA: Arsenic

Signs and Symptoms of Exposure: Nausea, tightness of chest, fever, irritation of eyes, nose, throat and skin.

Medical Conditions Generally Aggravated by Exposure: Chronic lung disease, allergic conditions.

Emergency and First Aid Procedures: Dust, welding fumes - remove to fresh air.
Eye/skin contact - flush with water.

VII PRECAUTIONS FOR SAFE HANDLING AND USE

Steps To Be Taken In Case of Release or Spill: Chips and dust should be swept up and placed in suitable container. Prevent release to sinks, drains, sewers, or water runoff.

Waste Disposal Method: Material not known to be a RCRA hazardous waste, follow local requirements.

Precautions to be Taken in Handling and Storing: Use good housekeeping to minimize particle accumulation.

Other precautions: Ventilate welding, brazing and grinding operations.

VIII CONTROL MEASURES

Respiratory Protection: Dust/fume respirator
Local Exhaust: Required for welding, grinding operations
Protective Gloves: As needed based on operations
Eye Protection: As needed

Other Protective Clothing or Equipment: May be needed for welding or grinding







80000 SERIES
10% P.C.W.
RECYCLED

OCT 19 1998

LAL # 112736



ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 North Grand Avenue East, P.O. Box 19276, Springfield, Illinois 62794-9276 Mary A. Gade, Director

217/782-6762

September 30, 1998

Application Received: 07/02/98

Permit Issued To:

Waste Stream/Authorization Number 980020

Permit Expires: 9/30/03

Land & Lakes Company
123 N. Northwest Hwy.
P.O. Box 778
Park Ridge, IL 60068

Land & Lakes Company
123 N. Northwest Hwy.
P.O. Box 778
Park Ridge, IL 60068

Waste Name: Oil Contaminated Pigs
Waste Class 80 Non-Haz Not Subject to Fee

Permit To Receive the Indicated Waste is Granted.

Receiving Facility Name: River Bend Prairie
IEPA Facility No.: 0310690003

Disposition of Waste: 25

Waste Treatment: Bulk or containerized mixed with daily refuse.

Storage:

Attention: Ken Morris
Waste Generator: Sheffield Steel Corporation

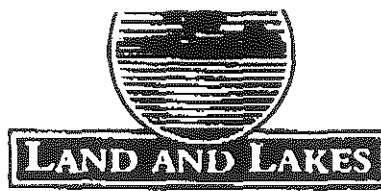
IEPA Generator No.: 1970455019
Sheffield Steel Corporation
P.O. Box 727
Joliet, IL 60434

This permit is granted subject to the attached standard conditions and any special conditions listed below.

1. In renewing Permit No. 980020, the Agency has relied on a statement by the operator of this facility in an LPC-PA15 form received 06/10/93 that a demonstration shall be made that a unit or units within this facility either do or will meet the standards described in 35 Ill. Adm. Code, Part 814, Subpart C.

In the event that such a demonstration is not made, the Agency may seek revocation of this permit pursuant to 35 Ill. Adm. Code, Section 807.212 and/or may initiate enforcement action. The objectives of such enforcement action may include exhumation of all waste disposed under this renewed permit.

This special Waste may only be disposed in units which meet the requirements of 35 Ill. Adm. Code Part 814.



Generic Permit Authorization Issued to:

SITE ADDRESS

Sheffield Steel Corp.
P.O. Box 727
Joliet, Illinois 60434
Attention: Ken Morris

Sheffield Steel Corp.
1 Industrial Avenue
Joliet, Illinois 60434

Phone Number: (815) 723-9335

Generator IEPA No.: 1970455019

Generic Waste Name: Oil Contaminated Absorbent Pigs

Waste Status: Non-Hazardous

Approved Date 09/23/97

Authorization No.: N/A (Leave blank or use 000000)

Expiration Date 12/31/99

Land and Lakes Approval No.: 112326

Landfill Information: Harbor View

2000 East 122nd Street

Chicago, IL 60633

Phone Number: (773) 646-1138

Landfill IEPA No: 0316000034

Landfill payment at time of disposal by prior approved account, money order, cashier's check, certified check or cash, only.

Permit Granted Subject to: Waste Contains No Free Liquids. Waste Must Have Flash Point > 140° F.
Waste Must Be Hauled By an IEPA Licensed Special Waste Hauler.

Amanda R. Miller

Amanda R. Miller
Manager, Special Waste
Land and Lakes Company



80000 SERIES
10% P.C.W.



ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 North Grand Avenue East, P.O. Box 19276, Springfield, Illinois 62794-9276

Mary A. Gade, Director

RECEIVED

AUG 24 1990

Ans'd

217/782-6762

AUGUST 13, 1990

APPLICATION RECEIVED: 07/02/90

PERMIT ISSUED TO:

WASTE STREAM/AUTHORIZATION NUMBER 980000

PERMIT EXPIRES: 08/11/03

LAND & LAKES COMPANY
123 N NORTHWEST HWY
P.O. BOX 778
PARK RIDGE

IL
60068

LAND & LAKES COMPANY
123 N NORTHWEST HWY
P.O. BOX 778
PARK RIDGE

IL
60068

WASTE NAME: BEARING GREASE
WASTE CLASS 80 NON-HAZ NOT SUBJECT TO FEE

PERMIT TO RECEIVE THE INDICATED WASTE IS GRANTED.

LALC # 113522

RECEIVING FACILITY NAME: RIVER BEND PRAIRIE
IEPA FACILITY NO.: 0310690003

DISPOSITION OF WASTE: 25
BULK OR CONTAINERIZED MIXED WITH DAILY REFUSE

WASTE TREATMENT:

STORAGE:

ATTENTION: KEN MORRIS
WASTE GENERATOR: SHEFFIELD STEEL
INDUSTRY AVE
JOLIET

IL
60434

IEPA GENERATOR NO.: 1970455019

THIS PERMIT IS GRANTED SUBJECT TO THE ATTACHED STANDARD CONDITIONS AND ANY SPECIAL CONDITIONS LISTED BELOW.

1. IN ISSUING PERMIT NO. 980000, THE AGENCY HAS RELIED ON A STATEMENT BY THE OPERATOR OF THIS FACILITY IN AN LPC-PA15 FORM RECEIVED 06/10/93 THAT A DEMONSTRATION SHALL BE MADE THAT A UNIT OR UNITS WITHIN THIS FACILITY EITHER DO OR WILL MEET THE STANDARDS DESCRIBED IN 35 ILL. ADM. CODE, PART 814, SUBPART C.

IN THE EVENT THAT SUCH A DEMONSTRATION IS NOT MADE, THE AGENCY MAY SEEK REVOCATION OF THIS PERMIT PURSUANT TO 35 ILL. ADM. CODE, SECTION 807.212 AND/OR MAY INITIATE ENFORCEMENT ACTION. THE OBJECTIVES OF SUCH ENFORCEMENT ACTION MAY INCLUDE EXHUMATION OF ALL WASTE DISPOSED UNDER THIS PERMIT.

THIS SPECIAL WASTE MAY ONLY BE DISPOSED IN UNITS WHICH MEET THE REQUIREMENTS OF 35 ILL. ADM. CODE PART 814.



Generic Permit Authorization Issued to:

SITE ADDRESS

Sheffield Steel Corp.
P.O. Box 727
Joliet, Illinois 60434
Attention: Ken Morris

Sheffield Steel Corp.
1 Industrial Avenue
Joliet, Illinois 60434

Phone Number: (815) 723-9335

Generator IEPA No.: 1970455019

Generic Waste Name: Bearing Grease

Waste Status: Non-Hazardous

Approved Date 09/29/97

Authorization No.: N/A (Leave blank or use 000000)

Expiration Date 12/31/99

Land and Lakes Approval No.: 112342

Landfill Information: Harbor View
2000 East 122nd Street
Chicago, IL 60633

Phone Number: (773) 646-1138

Landfill IEPA No: 0316000034

Landfill payment at time of disposal by prior approved account, money order, cashier's check, certified check or cash, only.

Permit Granted Subject to: Waste Contains No Free Liquids. Waste Must Have Flash Point > 140° F.
Waste Must Be Hauled By an IEPA Licensed Special Waste Hauler.

Amanda R. Miller

Amanda R. Miller
Manager, Special Waste
Land and Lakes Company



80000 SERIES
10% P.C.W.

MOBIL OIL CORPORATION MATERIAL SAFETY DATA BULLETIN

REVISED: 05/04/89

***** I. PRODUCT IDENTIFICATION ***** MOBILGREASE SM

SUPPLIER:	HEALTH EMERGENCY TELEPHONE:
MOBIL OIL CORP.	(212) 883-4411
CHEMICAL NAMES AND SYNONYMS:	TRANSPORT EMERGENCY TELEPHONE:
PET. HYDROCARBONS AND ADDITIVES	(800) 424-9300 (CHEMTREC)
USE OR DESCRIPTION:	PRODUCT TECHNICAL INFORMATION:
STEEL MILL GREASE	(800) 662-4525

***** II. TYPICAL CHEMICAL AND PHYSICAL PROPERTIES *****

APPEARANCE: BLACK GREASE ODOR: MILD PH: NA
 VISCOSITY AT 100 F, SUS: 1650.0 AT 40 C, CS: 330.0
 VISCOSITY AT 210 F, SUS: 112.5 AT 100 C, CS: 22.5
 FLASH POINT F(C): > 400(204) (ASTM D-92)
 MELTING POINT F(C): NA POUR POINT F(C): NA
 BOILING POINT F(C): > 600(316)
 RELATIVE DENSITY, 15/4 C: 0.878 SOLUBILITY IN WATER: NEGLIGIBLE
 VAPOR PRESSURE-MM HG 20C: < .1
 NOTE: MOST PHYSICAL PROPERTIES FOR OIL COMPONENT.
 NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES
 FOR FURTHER INFORMATION, CONTACT YOUR LOCAL MARKETING OFFICE.

***** III. INGREDIENTS *****

	WT PCT	EXPOSURE LIMITS	SOURCES
	(APPROX)	MG/M3 PPM	(AND NOTES)
POTENTIALLY HAZARDOUS INGREDIENTS:			
NONE			

OTHER INGREDIENTS:
 REFINED MINERAL OILS >55
 ADDITIVES AND/OR OTHER INGREDIENTS <10
 LITHIUM-SOAP THICKENER <10
 PETROLEUM ASPHALTS <30

SEE SECTION XII FOR COMPONENT REGULATORY INFORMATION.

SOURCES: A=ACGIH-TLV, A*=SUGGESTED-TLV, M=MOBIL, O=OSHA, S=SUPPLIER
 NOTE: LIMITS SHOWN FOR GUIDANCE ONLY. FOLLOW APPLICABLE REGULATIONS.

***** IV. HEALTH HAZARD DATA *****

--- INCLUDES AGGRAVATED MEDICAL CONDITIONS, IF ESTABLISHED ---
 EFFECTS OF OVEREXPOSURE: SLIGHT EYE IRRITATION. SLIGHT SKIN IRRITATION.

***** V. EMERGENCY AND FIRST AID PROCEDURES *****
 --- FOR PRIMARY ROUTES OF ENTRY ---

EYE CONTACT: FLUSH WITH WATER.

SKIN CONTACT: WASH CONTACT AREAS WITH SOAP AND WATER. HIGH PRESSURE ACCIDENTAL INJECTION THROUGH THE SKIN REQUIRES IMMEDIATE MEDICAL ATTENTION FOR POSSIBLE INCISION, IRRIGATION AND/OR DEBRIDEMENT.

INHALATION: NOT EXPECTED TO BE A PROBLEM.

INGESTION: NOT EXPECTED TO BE A PROBLEM. HOWEVER, IF GREATER THAN 1/2 LITER (PINT) INGESTED, IMMEDIATELY GIVE 1 TO 2 GLASSES OF WATER AND CALL A PHYSICIAN, HOSPITAL EMERGENCY ROOM OR POISON CONTROL CENTER FOR ASSISTANCE. DO NOT INDUCE VOMITING OR GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

***** VI. FIRE AND EXPLOSION HAZARD DATA *****

FLASH POINT F(C): > 400(204) (ASTM D-92)

FLAMMABLE LIMITS. LEL: .6 UEL: 7.0

EXTINGUISHING MEDIA: CARBON DIOXIDE, FOAM, DRY CHEMICAL AND WATER FOG.

SPECIAL FIRE FIGHTING PROCEDURES: WATER OR FOAM MAY CAUSE FROTHING.

USE WATER TO KEEP FIRE EXPOSED CONTAINERS COOL. WATER SPRAY MAY BE USED TO FLUSH SPILLS AWAY FROM EXPOSURE. FOR FIRES IN ENCLOSED AREAS, FIREFIGHTERS MUST USE SELF-CONTAINED BREATHING APPARATUS. PREVENT RUNOFF FROM FIRE CONTROL OR DILUTION FROM ENTERING STREAMS OR DRINKING WATER SUPPLY.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

NFPA HAZARD ID: HEALTH: 0, FLAMMABILITY: 1, REACTIVITY: 0

***** VII. REACTIVITY DATA *****

STABILITY (THERMAL, LIGHT, ETC.): STABLE

CONDITIONS TO AVOID: EXTREME HEAT

INCOMPATIBILITY (MATERIALS TO AVOID): STRONG OXIDIZERS

HAZARDOUS DECOMPOSITION PRODUCTS: CARBON MONOXIDE.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

***** VIII. SPILL OR LEAK PROCEDURE *****

ENVIRONMENTAL IMPACT: REPORT SPILLS AS REQUIRED TO APPROPRIATE AUTHORITIES. U. S. COAST GUARD REGULATIONS REQUIRE IMMEDIATE REPORTING OF SPILLS THAT COULD REACH ANY WATERWAY INCLUDING INTERMITTENT DRY CREEKS. REPORT SPILL TO COAST GUARD TOLL FREE NUMBER 800-424-8802.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED: SHOVEL UP AND DISPOSE OF AT AN APPROPRIATE WASTE DISPOSAL FACILITY IN ACCORDANCE WITH CURRENT APPLICABLE LAWS AND REGULATIONS, AND PRODUCT CHARACTERISTICS AT TIME OF DISPOSAL.

WASTE MANAGEMENT: DISPOSE OF WASTE AT AN APPROPRIATE WASTE DISPOSAL FACILITY IN ACCORDANCE WITH CURRENT APPLICABLE LAWS AND REGULATIONS, AND PRODUCT CHARACTERISTICS AT TIME OF DISPOSAL.

***** IX. SPECIAL PROTECTION INFORMATION *****

EYE PROTECTION: NORMAL INDUSTRIAL EYE PROTECTION PRACTICES SHOULD BE EMPLOYED.

SKIN PROTECTION: NO SPECIAL EQUIPMENT REQUIRED. HOWEVER, GOOD PERSONAL HYGIENE PRACTICES SHOULD ALWAYS BE FOLLOWED.

RESPIRATORY PROTECTION: NO SPECIAL REQUIREMENTS UNDER ORDINARY CONDITIONS OF USE AND WITH ADEQUATE VENTILATION.

VENTILATION: NO SPECIAL REQUIREMENTS UNDER ORDINARY CONDITIONS OF USE AND WITH ADEQUATE VENTILATION.

***** X. SPECIAL PRECAUTIONS *****
NO SPECIAL PRECAUTIONS REQUIRED.

***** XI. TOXICOLOGICAL DATA *****
---ACUTE TOXICOLOGY---

ORAL TOXICITY (RATS): LD50: > 5 G/KG SLIGHTLY TOXIC (ESTIMATED) ---
BASED ON TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.
DERMAL TOXICITY (RABBITS): LD50: > 2 G/KG SLIGHTLY TOXIC (ESTIMATED) ---
BASED ON TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.
INHALATION TOXICITY (RATS): NOT APPLICABLE ---HARMFUL CONCENTRATIONS OF
MISTS AND/OR VAPORS ARE UNLIKELY TO BE ENCOUNTERED THROUGH ANY
CUSTOMARY OR REASONABLY FORESEEABLE HANDLING, USE, OR MISUSE OF
THIS PRODUCT.
EYE IRRITATION (RABBITS): MAY CAUSE SLIGHT IRRITATION. ---BASED ON
TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.
SKIN IRRITATION (RABBITS): MAY CAUSE SLIGHT IRRITATION ON PROLONGED OR
REPEATED CONTACT. ---BASED ON TESTING OF SIMILAR PRODUCTS AND/OR
THE COMPONENTS.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---
SEVERELY SOLVENT REFINED AND SEVERELY HYDROTREATED MINERAL BASE OILS
HAVE BEEN TESTED AT MOBIL ENVIRONMENTAL AND HEALTH SCIENCES
LABORATORY BY DERMAL APPLICATION TO RATS 5 DAYS/WEEK FOR 90 DAYS AT
DOSES SIGNIFICANTLY HIGHER THAN THOSE EXPECTED DURING NORMAL
INDUSTRIAL EXPOSURE. EXTENSIVE EVALUATIONS INCLUDING MICROSCOPIC
EXAMINATION OF INTERNAL ORGANS AND CLINICAL CHEMISTRY OF BODY
FLUIDS, SHOWED NO ADVERSE EFFECTS.

---CHRONIC TOXICOLOGY (SUMMARY)---
THE BASE OILS IN THIS PRODUCT ARE SEVERELY SOLVENT REFINED AND/OR
SEVERELY HYDROTREATED. TWO YEAR MOUSE SKIN PAINTING STUDIES OF
SIMILAR OILS SHOWED NO EVIDENCE OF CARCINOGENIC EFFECTS.

***** XII. REGULATORY INFORMATION *****
GOVERNMENTAL INVENTORY STATUS: ALL COMPONENTS REGISTERED IN ACCORDANCE WITH TSCA.

D.O.T. SHIPPING NAME: NOT APPLICABLE

D.O.T. HAZARD CLASS: NOT APPLICABLE

US OSHA HAZARD COMMUNICATION STANDARD: PRODUCT ASSESSED IN ACCORDANCE WITH OSHA 29 CFR 1910.1200 AND DETERMINED NOT TO BE HAZARDOUS.

RCRA INFORMATION: THE UNUSED PRODUCT, IN OUR OPINION, IS NOT SPECIFICALLY LISTED BY THE EPA AS A HAZARDOUS WASTE (40 CFR, PART 261D); DOES NOT EXHIBIT THE HAZARDOUS CHARACTERISTICS OF IGNITABILITY, CORROSIVITY, OR REACTIVITY, AND IS NOT FORMULATED WITH THE METALS CITED IN THE EP TOXICITY TEST. HOWEVER, USED PRODUCT MAY BE REGULATED.

THIS PRODUCT HAS BEEN USDA APPROVED UNDER THE FOLLOWING CATEGORY: H2 - LUBRICANTS WITH NO FOOD CONTACT

U.S. SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) TITLE III: THIS PRODUCT CONTAINS NO "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (302) REPORTABLE HAZARD CATEGORIES: NONE

THIS PRODUCT CONTAINS THE FOLLOWING SARA (313) TOXIC RELEASE CHEMICALS:

ZINC DIALKYL DITHIOPHOSPHATE 68457-79-4 1.07%

THE FOLLOWING PRODUCT INGREDIENTS ARE CITED ON THE LISTS BELOW:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS
ASPHALT (PETROLEUM)	8052-42-4	2,7,9,10,12,13,14,16
ZINC (ELEMENTAL ANALYSIS) (0.12%)	7440-66-6	15

--- KEY TO LIST CITATIONS ---

1 = OSHA Z, 2 = ACGIH, 3 = IARC, 4 = NTP, 5 = NCI,
6 = EPA CARC, 7 = NFPA 49, 8 = NFPA 325M, 9 = DOT HMT, 10 = CA RTK,
11 = IL RTK, 12 = MA RTK, 13 = MN RTK, 14 = NJ RTK, 15 = MI 293,
16 = FL RTK, 17 = PA RTK, 18 = CA P65.

--- NTP, IARC, AND OSHA INCLUDE CARCINOGENIC LISTINGS ---

NOTE: MOBIL PRODUCTS ARE NOT FORMULATED TO CONTAIN PCBS.

INFORMATION GIVEN HEREIN IS OFFERED IN GOOD FAITH AS ACCURATE, BUT WITHOUT GUARANTEE. CONDITIONS OF USE AND SUITABILITY OF THE PRODUCT FOR PARTICULAR USES ARE BEYOND OUR CONTROL; ALL RISKS OF USE OF THE PRODUCT ARE THEREFORE ASSUMED BY THE USER AND WE EXPRESSLY DISCLAIM ALL WARRANTIES OF EVERY KIND AND NATURE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN RESPECT TO THE USE OR SUITABILITY OF THE PRODUCT. NOTHING IS INTENDED AS A RECOMMENDATION FOR USES WHICH INFRINGE VALID PATENTS OR AS EXTENDING LICENSE UNDER VALID PATENTS. APPROPRIATE WARNINGS AND SAFE HANDLING PROCEDURES SHOULD BE PROVIDED TO HANDLERS AND USERS.

PREPARED BY: MOBIL OIL CORPORATION

ENVIRONMENTAL AFFAIRS AND TOXICOLOGY DEPARTMENT, PRINCETON, NJ

FOR FURTHER INFORMATION, CONTACT:

MOBIL OIL CORPORATION, PRODUCT FORMULATION AND QUALITY CONTROL

3225 GALLOWS ROAD, FAIRFAX, VA 22037

(703) 849-3265

***** APPENDIX *****

FOR MOBIL USE ONLY: (FILL NO: MTR248001) MCN: , MHC: 1* 1* NA 1* 1*,
MPPEC: A, PPEC: A, US86-369 APPROVE 05/04/89

Mobil

SWEENEY OIL CO.

581-4800

641050-02 PAGE 1 OF 5

MOBIL OIL CORPORATION MATERIAL SAFETY DATA BULLETIN

REVISED: 12/08/89

***** I. PRODUCT IDENTIFICATION *****

MOBILUX EP 023

SUPPLIER:

MOBIL OIL CORP.

CHEMICAL NAMES AND SYNONYMS:

PET. HYDROCARBONS AND ADDITIVES

USE OR DESCRIPTION:

INDUSTRIAL GREASE

HEALTH EMERGENCY TELEPHONE:

(609) 737-4411

TRANSPORT EMERGENCY TELEPHONE:

(800) 424-9300 (CHEMTREC)

PRODUCT TECHNICAL INFORMATION:

(800) 662-4525

***** II. TYPICAL CHEMICAL AND PHYSICAL PROPERTIES *****

APPEARANCE: BROWN

GREASE

ODOR: MILD

PH: NA

VISCOSITY AT 100 F, SUS: 1685.0 AT 40 C, CS: 337.0

VISCOSITY AT 210 F, SUS: 115.0 AT 100 C, CS: 23.0

FLASH POINT F(C): > 400(204) (ASTM D-92)

MELTING POINT F(C): NA

POUR POINT F(C): NE

BOILING POINT F(C): > 600(316)

RELATIVE DENSITY, 15/4 C: 0.91

SOLUBILITY IN WATER: NEGLIGIBLE

VAPOR PRESSURE-MM HG 20C: < .1

NOTE: MOST PHYSICAL PROPERTIES FOR OIL COMPONENT.

NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES

FOR FURTHER INFORMATION, CONTACT YOUR LOCAL MARKETING OFFICE.

***** III. INGREDIENTS *****

WT PCT (APPROX)	EXPOSURE LIMITS MG/M3 PPM	SOURCES (AND NOTES)
--------------------	------------------------------	------------------------

POTENTIALLY HAZARDOUS INGREDIENTS:

NONE

OTHER INGREDIENTS:

REFINED MINERAL OILS >90

ADDITIVES AND/OR OTHER INGREDIENTS. <10

LITHIUM-SOAP THICKENER < 5

PETROLEUM ASPHALTS < 5

SEE SECTION XII FOR COMPONENT REGULATORY INFORMATION.

SOURCES: A=ACGIH-TLV, A*=SUGGESTED-TLV, M=MOBIL, O=OSHA, S=SUPPLIER

NOTE: LIMITS SHOWN FOR GUIDANCE ONLY. FOLLOW APPLICABLE REGULATIONS.

***** IV. HEALTH HAZARD DATA *****

--- INCLUDES AGGRAVATED MEDICAL CONDITIONS, IF ESTABLISHED ---

EFFECTS OF OVEREXPOSURE: SLIGHT EYE IRRITATION. SLIGHT SKIN IRRITATION.

***** V. EMERGENCY AND FIRST AID PROCEDURES *****
--- FOR PRIMARY ROUTES OF ENTRY ---

EYE CONTACT: FLUSH WITH WATER.

SKIN CONTACT: WASH CONTACT AREAS WITH SOAP AND WATER. HIGH PRESSURE ACCIDENTAL INJECTION THROUGH THE SKIN REQUIRES IMMEDIATE MEDICAL ATTENTION FOR POSSIBLE INCISION, IRRIGATION AND/OR DEBRIDEMENT.

INHALATION: NOT EXPECTED TO BE A PROBLEM.

INGESTION: NOT EXPECTED TO BE A PROBLEM. HOWEVER, IF GREATER THAN 1/2 LITER (PINT) INGESTED, IMMEDIATELY GIVE 1 TO 2 GLASSES OF WATER AND CALL A PHYSICIAN, HOSPITAL EMERGENCY ROOM OR POISON CONTROL CENTER FOR ASSISTANCE. DO NOT INDUCE VOMITING OR GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

***** VI. FIRE AND EXPLOSION HAZARD DATA *****

FLASH POINT F(C): > 400(204) (ASTM D-92)

FLAMMABLE LIMITS. LEL: NE UEL: NE

EXTINGUISHING MEDIA: CARBON DIOXIDE, FOAM, DRY CHEMICAL AND WATER FOG.

SPECIAL FIRE FIGHTING PROCEDURES: WATER OR FOAM MAY CAUSE FROTHING.

USE WATER TO KEEP FIRE EXPOSED CONTAINERS COOL. WATER SPRAY MAY BE USED TO FLUSH SPILLS AWAY FROM EXPOSURE. FOR FIRES IN ENCLOSED AREAS, FIREFIGHTERS MUST USE SELF-CONTAINED BREATHING APPARATUS. PREVENT RUNOFF FROM FIRE CONTROL OR DILUTION FROM ENTERING STREAMS OR DRINKING WATER SUPPLY.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

NFPA HAZARD ID: HEALTH: 0, FLAMMABILITY: 1, REACTIVITY: 0

***** VII. REACTIVITY DATA *****

STABILITY (THERMAL, LIGHT, ETC.): STABLE

CONDITIONS TO AVOID: EXTREME HEAT

INCOMPATIBILITY (MATERIALS TO AVOID): STRONG OXIDIZERS

HAZARDOUS DECOMPOSITION PRODUCTS: CARBON MONOXIDE. METAL OXIDES.

HYDROGEN SULFIDE. NITROGEN OXIDES.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

***** VIII. SPILL OR LEAK PROCEDURE *****

ENVIRONMENTAL IMPACT: REPORT SPILLS AS REQUIRED TO APPROPRIATE AUTHORITIES. U. S. COAST GUARD REGULATIONS REQUIRE IMMEDIATE REPORTING OF SPILLS THAT COULD REACH ANY WATERWAY INCLUDING INTERMITTENT DRY CREEKS. REPORT SPILL TO COAST GUARD TOLL FREE NUMBER 800-424-8802.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED: SHOVEL UP AND DISPOSE OF AT AN APPROPRIATE WASTE DISPOSAL FACILITY IN ACCORDANCE WITH CURRENT APPLICABLE LAWS AND REGULATIONS, AND PRODUCT CHARACTERISTICS AT TIME OF DISPOSAL.

WASTE MANAGEMENT: DISPOSE OF WASTE AT AN APPROPRIATE WASTE DISPOSAL FACILITY IN ACCORDANCE WITH CURRENT APPLICABLE LAWS AND REGULATIONS, AND PRODUCT CHARACTERISTICS AT TIME OF DISPOSAL.

***** IX. SPECIAL PROTECTION INFORMATION *****

EYE PROTECTION: NORMAL INDUSTRIAL EYE PROTECTION PRACTICES SHOULD BE EMPLOYED.

SKIN PROTECTION: IF PROLONGED OR REPEATED SKIN CONTACT IS LIKELY, OIL IMPERVIOUS GLOVES SHOULD BE WORN. GOOD PERSONAL HYGIENE PRACTICES SHOULD ALWAYS BE FOLLOWED.

RESPIRATORY PROTECTION: NO SPECIAL REQUIREMENTS UNDER ORDINARY CONDITIONS OF USE AND WITH ADEQUATE VENTILATION.

VENTILATION: NO SPECIAL REQUIREMENTS UNDER ORDINARY CONDITIONS OF USE AND WITH ADEQUATE VENTILATION.

***** X. SPECIAL PRECAUTIONS *****
NO SPECIAL PRECAUTIONS REQUIRED.

***** XI. TOXICOLOGICAL DATA *****
---ACUTE TOXICOLOGY---

ORAL TOXICITY (RATS): LD50: > 5 G/KG SLIGHTLY TOXIC (ESTIMATED) ---
BASED ON TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.
DERMAL TOXICITY (RABBITS): LD50: > 2 G/KG SLIGHTLY TOXIC (ESTIMATED) ---
BASED ON TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.
INHALATION TOXICITY (RATS): NOT APPLICABLE ---HARMFUL CONCENTRATIONS OF
MISTS AND/OR VAPORS ARE UNLIKELY TO BE ENCOUNTERED THROUGH ANY
CUSTOMARY OR REASONABLY FORESEEABLE HANDLING, USE, OR MISUSE OF
THIS PRODUCT.
EYE IRRITATION (RABBITS): MAY CAUSE SLIGHT IRRITATION. ---BASED ON
TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.
SKIN IRRITATION (RABBITS): MAY CAUSE SLIGHT IRRITATION ON PROLONGED OR
REPEATED CONTACT. ---BASED ON TESTING OF SIMILAR PRODUCTS AND/OR
THE COMPONENTS.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---
SEVERELY SOLVENT REFINED AND SEVERELY HYDROTREATED MINERAL BASE OILS
HAVE BEEN TESTED AT MOBIL ENVIRONMENTAL AND HEALTH SCIENCES
LABORATORY BY DERMAL APPLICATION TO RATS 5 DAYS/WEEK FOR 90 DAYS AT
DOSES SIGNIFICANTLY HIGHER THAN THOSE EXPECTED DURING NORMAL
INDUSTRIAL EXPOSURE. EXTENSIVE EVALUATIONS INCLUDING MICROSCOPIC
EXAMINATION OF INTERNAL ORGANS AND CLINICAL CHEMISTRY OF BODY
FLUIDS, SHOWED NO ADVERSE EFFECTS.

---CHRONIC TOXICOLOGY (SUMMARY)---
THE BASE OILS IN THIS PRODUCT ARE SEVERELY SOLVENT REFINED AND/OR
SEVERELY HYDROTREATED. TWO YEAR MOUSE SKIN PAINTING STUDIES OF
SIMILAR OILS SHOWED NO EVIDENCE OF CARCINOGENIC EFFECTS.

***** XII. REGULATORY INFORMATION *****
GOVERNMENTAL INVENTORY STATUS: ALL COMPONENTS REGISTERED IN ACCORDANCE WITH TSCA.

D.O.T. SHIPPING NAME: NOT APPLICABLE

D.O.T. HAZARD CLASS: NOT APPLICABLE

US OSHA HAZARD COMMUNICATION STANDARD: PRODUCT ASSESSED IN ACCORDANCE WITH OSHA 29 CFR 1910.1200 AND DETERMINED NOT TO BE HAZARDOUS.

RCRA INFORMATION: THE UNUSED PRODUCT, IN OUR OPINION, IS NOT SPECIFICALLY LISTED BY THE EPA AS A HAZARDOUS WASTE (40 CFR, PART 261D); DOES NOT EXHIBIT THE HAZARDOUS CHARACTERISTICS OF IGNITABILITY, CORROSIVITY, OR REACTIVITY, AND IS NOT FORMULATED WITH THE METALS CITED IN THE EP TOXICITY TEST. HOWEVER, USED PRODUCT MAY BE REGULATED.

THIS PRODUCT HAS BEEN USDA APPROVED UNDER THE FOLLOWING CATEGORY: H2 - LUBRICANTS WITH NO FOOD CONTACT

U.S. SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) TITLE III: THIS PRODUCT CONTAINS NO "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (302) REPORTABLE HAZARD CATEGORIES: NONE

THIS PRODUCT CONTAINS THE FOLLOWING SARA (313) TOXIC RELEASE CHEMICALS:

ZEINS (ZINC RESINATE)	9010-69-9	1%
ZINC DIALKYL DITHIOPHOSPHATE	68457-79-4	1.28%

THE FOLLOWING PRODUCT INGREDIENTS ARE CITED ON THE LISTS BELOW:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS
ZEINS (ZINC RESINATE)	9010-69-9	9
CHLORINE (ELEMENTAL ANALYSIS) (0.6%)	7782-50-5	15
ZINC (ELEMENTAL ANALYSIS) (0.14%)	7440-66-6	15

--- KEY TO LIST CITATIONS ---

1 = OSHA Z, 2 = ACGIH, 3 = IARC, 4 = NTP, 5 = NCI,
6 = EPA CARC, 7 = NFPA 49, 8 = NFPA 325M, 9 = DOT HMT, 10 = CA RTK,
11 = IL RTK, 12 = MA RTK, 13 = MN RTK, 14 = NJ RTK, 15 = MI 293,
16 = FL RTK, 17 = PA RTK, 18 = CA P65.

--- NTP, IARC, AND OSHA INCLUDE CARCINOGENIC LISTINGS ---

NOTE: MOBIL PRODUCTS ARE NOT FORMULATED TO CONTAIN PCBS.

INFORMATION GIVEN HEREIN IS OFFERED IN GOOD FAITH AS ACCURATE, BUT WITHOUT GUARANTEE. CONDITIONS OF USE AND SUITABILITY OF THE PRODUCT FOR PARTICULAR USES ARE BEYOND OUR CONTROL; ALL RISKS OF USE OF THE PRODUCT ARE THEREFORE ASSUMED BY THE USER AND WE EXPRESSLY DISCLAIM ALL WARRANTIES OF EVERY KIND AND NATURE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN RESPECT TO THE USE OR SUITABILITY OF THE PRODUCT. NOTHING IS INTENDED AS A RECOMMENDATION FOR USES WHICH INFRINGE VALID PATENTS OR AS EXTENDING LICENSE UNDER VALID PATENTS. APPROPRIATE WARNINGS AND SAFE HANDLING PROCEDURES SHOULD BE PROVIDED TO HANDLERS AND USERS.



PREPARED BY: MOBIL OIL CORPORATION

ENVIRONMENTAL AFFAIRS AND TOXICOLOGY DEPARTMENT, PRINCETON, NJ

FOR FURTHER INFORMATION, CONTACT:

MOBIL OIL CORPORATION. PRODUCT FORMULATION AND QUALITY CONTROL

3225 GALLOWES ROAD, FA FAX, VA 22037

(703) 849-3265

***** APPENDIX *****

FOR MOBIL USE ON : (FILL NO: RR175A000A1) MCN: AHC: 1* 1* NA 1*

1*, MPPEC: A, PPEC: A, US86-167 APPROVE 05/04/89

EXXON COMPANY, U.S.A.
A DIVISION OF EXXON CORPORATION

DATE ISSUED: 01/24/95
SUPERSEDES DATE: 12/15/94

MATERIAL SAFETY DATA SHEET

EXXON COMPANY, U.S.A. P.O. BOX 2180 HOUSTON, TX 77252-2180

A. IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME
FIREXX GREASE 1

PRODUCT CODE
425215 - 05215

PRODUCT CATEGORY
Petroleum Lubricating Grease

PRODUCT APPEARANCE AND ODOR
Soft black grease
Mild sulfurous odor

MEDICAL EMERGENCY TELEPHONE NUMBER
(713) 656-3424

B. COMPONENTS AND HAZARD INFORMATION

COMPONENTS	CAS NO. OF COMPONENTS	APPROXIMATE CONCENTRATION
Distillates (petroleum), solvent-refined heavy naphthenic and	64741-96-4	Greater than 66%
Distillates (petroleum), solvent-dewaxed heavy naphthenic and	and 64742-63-8	
Distillates (petroleum), hydrotreated heavy paraffinic or	and 64742-54-7	
Distillates (petroleum), solvent-dewaxed heavy paraffinic and	or 64742-65-0	
Aluminum, benzoate hydrogenated tallow fatty acid iso-Pr alc. complexes	and 68647-58-5	
Asphalt	8052-42-4	Approximately 13%
Proprietary additives	Mixture	Less than 21%

All components of this product are listed on the U.S. TSCA inventory.

See Section E for Health and Hazard Information.

See Section H for additional Environmental Information.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

Health 1 Flammability 1 Reactivity 0

BASIS
Recommended by Exxon

EXPOSURE LIMIT FOR TOTAL PRODUCT

5 mg/m³ for oil mist (aerosol) for an 8-hour workday

BASIS

OSHA Regulation 29 CFR 1910.1000 and recommended by the American Conference of Governmental Industrial Hygienists (ACGIH). ACGIH states that the air is to be sampled by a method that does not collect vapor; in addition, it lists a 10 mg/m³ STEL.

C. PRIMARY ROUTES OF ENTRY AND EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT

If lubricant gets into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.

SKIN

In case of skin contact, remove any contaminated clothing and wash skin with soap and water. Launder or dry-clean clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

INHALATION

Vapor pressure is very low. Vapor inhalation under ambient conditions is normally not a problem. If overcome by vapor from hot product, immediately remove from exposure and call a physician. If breathing is irregular or has stopped, start resuscitation; administer oxygen, if available. If overexposed to oil mist, remove from further exposure until excessive oil mist condition subsides.

INGESTION

If ingested, DO NOT induce vomiting; call a physician immediately.

D. FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT (MINIMUM)

204°C (400°F)

ASTM D 92, Cleveland Open Cup

AUTOIGNITION TEMPERATURE

Greater than 260°C (500°F)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION

Health Flammability Reactivity

1

1

0

BASIS

Recommended by Exxon

HANDLING PRECAUTIONS

Use product with caution around heat, sparks, pilot lights, static electricity, and open flame.

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)

Estimated values: Lower Flammable Limit 0.9%

Upper Flammable Limit 7%

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES

Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials", Tenth Edition (1991):

Use water spray, dry chemical, foam or carbon dioxide to extinguish the fire. Use water to keep fire-exposed containers cool. If a leak or spill has not ignited, use water spray to disperse the vapors and to provide protection for men attempting to stop a leak. Water spray may be used to flush spills away from exposures. Minimize breathing of gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS

Fumes, smoke, carbon monoxide, sulfur oxides, metal oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

"EMPTY" CONTAINER WARNING

"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

"Empty" drum liners retain residue (solid, liquid, and/or vapor) that will burn and can be dangerous. Keep away from heat, sparks, flames, static electricity or other sources of ignition. Do not reuse liners for any purpose whatsoever. Liners should be emptied of contents to the maximum extent practical, then segregated from liners containing other products. Dispose of "empty" liners in an environmentally safe manner and in accordance with governmental regulations.

E. HEALTH AND HAZARD INFORMATION**VARIABILITY AMONG INDIVIDUALS**

Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure)

Prolonged or repeated skin contact may cause skin irritation.

NATURE OF HAZARD AND TOXICITY INFORMATION

Repeated and prolonged overexposure to oil mists may result in droplet deposition, oil granuloma formation, inflammation and increased incidence of infection.

Prolonged or repeated skin contact with this product tends to remove skin oils, possibly leading to irritation and dermatitis; however, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant" by OSHA criteria.

Product contacting the eyes may cause eye irritation.

Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death.

This product is judged to have an acute oral LD50 (rat) greater than 5 g/kg of body weight, and an acute dermal LD50 (rabbit) greater than 3.16 g/kg of body weight.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE

None recognized

F. PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE

IBP Approximately 274°C (525°F)
by ASTM D 2887

VAPOR PRESSURE

Less than 0.01 mm Hg @ 20°C

SPECIFIC GRAVITY (15.6°C/15.6°C)
0.95

VAPOR DENSITY (AIR = 1)
Greater than 5

MOLECULAR WEIGHT
Not determined

PERCENT VOLATILE BY VOLUME
Negligible from open container
in 4 hours @ 38°C (100°F)

pH
Essentially neutral

**EVAPORATION RATE @ 1 ATM. AND 25°C
(77°F) (n-BUTYL ACETATE = 1)**
Less than 0.01

POUR, CONGEALING OR MELTING POINT
235°C (455°F)
Dropping Point by ASTM D 2265

**SOLUBILITY IN WATER @ 1 ATM.
AND 25°C (77°F)**
Negligible; less than 0.1%

VISCOSITY
300 Worked penetration, mm/10, @ 25°C, ASTM D 217

G. REACTIVITY

This product is stable and will not react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite, calcium hypochlorite, etc., as this presents a serious explosion hazard.

H. ENVIRONMENTAL INFORMATION

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Recover free product. Add sand, earth, or other suitable absorbent to spill area. Minimize skin contact. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses, or extensive land areas. Assure conformity with applicable governmental regulations.

THE FOLLOWING INFORMATION MAY BE USEFUL IN COMPLYING WITH VARIOUS STATE AND FEDERAL LAWS AND REGULATIONS UNDER VARIOUS ENVIRONMENTAL STATUTES:

REPORTABLE QUANTITY (RQ), EPA REGULATION 40 CFR 302 (CERCLA Section 102)
This Exxon product contains the RQ substance Kolate 7013 and a release of 4608 pounds of this Exxon product exceeds the CERCLA RQ and must be reported to the National Spill Response Center (1-800-424-8802).

THRESHOLD PLANNING QUANTITY (TPQ), EPA REGULATION 40 CFR 355 (SARA Sections 301-304)
No TPQ for product or any constituent greater than 1% or 0.1% (carcinogen).

TOXIC CHEMICAL RELEASE REPORTING, EPA REGULATION 40 CFR 372 (SARA Section 313)
This product contains approximately 2% zinc compounds.

HAZARDOUS CHEMICAL REPORTING, EPA REGULATION 40 CFR 370 (SARA Sections 311-312)

EPA HAZARD	Acute	Chronic	Fire	Pressure	Reactive	Not
CLASSIFICATION CODE:	Hazard	Hazard	Hazard	Hazard	Hazard	Applicable XXX

I. PROTECTION AND PRECAUTIONS

VENTILATION

Use local exhaust to capture vapor, mists or fumes, if necessary. Provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. No smoking, or use of flame or other ignition sources.

RESPIRATORY PROTECTION

Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

PROTECTIVE GLOVES

Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION

Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT

Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing, which could result in prolonged or repeated skin contact.

WORK PRACTICES / ENGINEERING CONTROLS

Keep containers closed when not in use. Do not store near heat, sparks, flame or strong oxidants.

In order to prevent fire or explosion hazards, use appropriate equipment.

Information on electrical equipment appropriate for use with this product may be found in the latest edition of the National Electrical Code (NFPA-70). This document is available from the National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

PERSONAL HYGIENE

Minimize breathing vapor, mist or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before re-use. Remove contaminated shoes and thoroughly clean before re-use; discard if oil-soaked. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

J. TRANSPORTATION AND OSHA RELATED LABEL INFORMATION**TRANSPORTATION INCIDENT INFORMATION**

For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation Emergency Response Guidebook for Hazardous Materials Incidents.

U.S. DOT HAZARDOUS MATERIALS SHIPPING DESCRIPTION

Not regulated

OSHA REQUIRED LABEL INFORMATION

In compliance with hazard and right-to-know requirements, where applicable OSHA Hazard Warnings may be found on the label, bill of lading or invoice accompanying this shipment.

Note: Product label may contain non-OSHA related information also.

The information and recommendations contained herein are, to the best of Exxon's knowledge and belief, accurate and reliable as of the date issued. Exxon does not warrant or guarantee their accuracy or reliability, and Exxon shall not be liable for any loss or damage arising out of the use thereof.

The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use. If buyer repackages this product, legal counsel should be consulted to insure proper health, safety and other necessary information is included on the container.

The Environmental Information included under Section H hereof as well as the Hazardous Materials Identification System (HMIS) and National Fire Protection

Association (NFPA) ratings have been included by Exxon Company, U.S.A. in order to provide additional health and hazard classification information. The ratings recommended are based upon the criteria supplied by the developers of these rating systems, together with Exxon's interpretation of the available data.

FOR LUBRICANTS TECHNICAL ASSISTANCE CALL: 1-800-443-9966

FOR FUELS TECHNICAL ASSISTANCE CALL: 713-656-4955

FOR AN MSDS OR ASSISTANCE WITH AN MSDS, DIRECT INQUIRIES TO THE ADDRESS BELOW OR CALL:

MARKETING TECHNICAL SERVICES
EXXON COMPANY, U.S.A.
ROOM 2345
P. O. BOX 2180
HOUSTON, TX 77252-2180
(713) 656-5949

IF YOU HAVE AN IMMEDIATE NEED FOR AN MSDS, DIAL 1-800-298-4007 FOR A FAXED COPY.

MOBIL OIL CORPORATION MATERIAL SAFETY DATA BULLETIN

***** I. PRODUCT IDENTIFICATION *****

SUPPLIER: MOBIL OIL CORP. HEALTH EMERGENCY TELEPHONE: (212) 983-4411
 CHEMICAL NAMES AND SYNONYMS: PET. HYDROCARBONS AND ADDITIVES TRANSPORT EMERGENCY TELEPHONE: (800) 424-9300 (CHEMTREC)
 USE OR DESCRIPTION: EXTREME PRESSURE GREASE

***** II. TYPICAL CHEMICAL AND PHYSICAL PROPERTIES *****

APPEARANCE: MEDIUM BROWN GREASE ODOR: MILD PH: NA
 VISCOSITY AT 100 F, SUS: 900.0 AT 40 C, CS: 170.0
 VISCOSITY AT 210 F, SUS: 75.0 AT 100 C, CS: 14.5
 FLASH POINT F(C): >400(204) (EST (OIL COC))
 MELTING POINT F(C): NA POUR POINT F(C): NA
 BOILING POINT F(C): > 600(316)
 RELATIVE DENSITY, 15/4 C: 0.879 SOLUBILITY IN WATER: NEGLIGIBLE
 VAPOR PRESSURE-MM HG 20C: < .1

NOTE: MOST PHYSICAL PROPERTIES FOR OIL COMPONENT.

NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES
 FOR FURTHER INFORMATION, CONTACT YOUR LOCAL MARKETING OFFICE.

***** III. INGREDIENTS *****

	WT PCT (APPROX)	EXPOSURE MG/M3	LIMITS PPM	SOURCES (AND NOTES)
HAZARDOUS INGREDIENTS:				
NONE				

OTHER INGREDIENTS:
 REFINED MINERAL OILS >80
 ADDITIVES AND/OR OTHER INGREDIENTS <10
 LITHIUM-SOAP THICKENER <10

KEY TO SOURCES: A=ACGIH-TLV, A*=SUGGESTED-TLV, M=MOBIL, O=OSHA
 NOTE: LIMITS SHOWN FOR GUIDANCE ONLY. FOLLOW APPLICABLE REGULATIONS.

***** IV. HEALTH HAZARD DATA *****

EFFECTS OF OVEREXPOSURE: SLIGHT EYE IRRITATION. SLIGHT SKIN IRRITATION.

***** V. EMERGENCY AND FIRST AID PROCEDURES *****

EYE CONTACT: FLUSH WITH WATER.
 SKIN CONTACT: WASH CONTACT AREAS WITH SOAP AND WATER.
 INHALATION: NOT EXPECTED TO OCCUR IN NORMAL INDUSTRIAL USE.
 INGESTION: NOT EXPECTED TO BE A PROBLEM. HOWEVER, IF GREATER THAN 1/2 LITER(PINT) INGESTED, IMMEDIATELY GIVE 1 TO 2 GLASSES OF WATER AND CALL A PHYSICIAN, HOSPITAL EMERGENCY ROOM OR POISON CONTROL CENTER FOR ASSISTANCE. DO NOT INDUCE VOMITING OR GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

***** VI. FIRE AND EXPLOSION HAZARD DATA *****

FLASH POINT F(C): > 400(204) (EST (OIL COC))

FLAMMABLE LIMITS. LEL: .6 UEL: 7.0

EXTINGUISHING MEDIA: CARBON DIOXIDE, FOAM, DRY CHEMICAL AND WATER FOG.

SPECIAL FIRE FIGHTING PROCEDURES: FIREFIGHTERS MUST USE SELF-CONTAINED BREATHING APPARATUS.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

***** VII. REACTIVITY DATA *****

STABILITY (THERMAL, LIGHT, ETC.): STABLE

CONDITIONS TO AVOID: EXTREME HEAT

INCOMPATIBILITY (MATERIALS TO AVOID): STRONG OXIDIZERS

HAZARDOUS DECOMPOSITION PRODUCTS: CARBON MONOXIDE.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

***** VIII. SPILL OR LEAK PROCEDURE *****

ENVIRONMENTAL IMPACT: REPORT SPILLS AS REQUIRED TO APPROPRIATE AUTHORITIES. U. S. COAST GUARD REGULATIONS REQUIRE IMMEDIATE REPORTING OF SPILLS THAT COULD REACH ANY WATERWAY INCLUDING INTERMITTENT DRY CREEKS. REPORT SPILL TO COAST GUARD TOLL FREE NUMBER 800-424-8802.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED: SCRAPE UP AND REMOVE. DISPOSE OF AT AN APPROPRIATE WASTE DISPOSAL FACILITY IN ACCORDANCE WITH CURRENT APPLICABLE LAWS AND REGULATIONS, AND PRODUCT CHARACTERISTICS AT TIME OF DISPOSAL.

WASTE MANAGEMENT: DISSOLVE WASTE IN A SOLVENT AND DISPOSE BY SUPERVISED INCINERATION IN COMPLIANCE WITH APPLICABLE LAWS AND REGULATIONS.

***** IX. SPECIAL PROTECTION INFORMATION *****

EYE PROTECTION: NORMAL INDUSTRIAL EYE PROTECTION PRACTICES SHOULD BE EMPLOYED.

SKIN PROTECTION: NO SPECIAL EQUIPMENT REQUIRED. HOWEVER, GOOD PERSONAL HYGIENE PRACTICES SHOULD ALWAYS BE FOLLOWED.

RESPIRATORY PROTECTION: NO SPECIAL REQUIREMENTS UNDER ORDINARY CONDITIONS OF USE AND WITH ADEQUATE VENTILATION.

VENTILATION: NO SPECIAL REQUIREMENTS UNDER ORDINARY CONDITIONS OF USE AND WITH ADEQUATE VENTILATION.

***** X. SPECIAL PRECAUTIONS *****

HANDLING: NO SPECIAL PRECAUTIONS REQUIRED.

***** XI. TOXICOLOGICAL DATA *****
---ACUTE---

ORAL TOXICITY (RATS): LD50: > 5 G/KG 0/10 RATS DIED AT THIS DOSSAGE LEVEL. SLIGHTLY TOXIC(ESTIMATED) ---BASED ON TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.

DERMAL TOXICITY (RABBITS): LD50: > 2 G/KG 0/06 RABBITS DIED AT THIS DOSSAGE LEVEL. SLIGHTLY TOXIC(ESTIMATED) ---BASED ON TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.

INHALATION TOXICITY (RATS): NOT APPLICABLE ---HARMFUL CONCENTRATIONS OF MISTS AND/OR VAPORS ARE UNLIKELY TO BE ENCOUNTERED THROUGH ANY CUSTOMARY OR REASONABLY FORESEEABLE HANDLING, USE, OR MISUSE OF THIS PRODUCT.

EYE IRRITATION (RABBITS): MAY CAUSE SLIGHT IRRITATION. EYE IRRITATION SCORES: 4.3 AT 1 HOUR, 1.7 AT 24 HOURS, 0.7 AT 48 HOURS, 0 AT 72 HOURS---BASED ON TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.

SKIN IRRITATION (RABBITS): MAY CAUSE SLIGHT IRRITATION ON PROLONGED OR REPEATED CONTACT. PRIMARY IRRITATION SCORE: 1.5/8---BASED ON TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.

---SUBACUTE AND MUTAGENICITY (SUMMARY)---

***NEGATIVE AMES TEST.

***** XII. REGULATORY INFORMATION *****

TSCA INVENTORY STATUS: ALL COMPONENTS ARE REGISTERED.

EINECS INVENTORY STATUS: ALL COMPONENTS ARE REGISTERED.

THE FOLLOWING PRODUCT INGREDIENTS ARE CITED ON THE LISTS BELOW:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS
---------------	------------	----------------

*** NO INGREDIENT CITATIONS ***

--- KEY TO LIST CITATIONS ---

1 = OSHA,	2 = ACGIH,	3 = IARC,	4 = NTP,	5 = NCI,
6 = EPA CARC,	7 = NFPA 49,	8 = NFPA 325M,	9 = DOT HMT,	10 = CA RTK,
11 = IL RTK,	12 = MA RTK,	13 = MN RTK,	14 = NJ RTK,	15 = NJ SHH,
16 = FL RTK,	17 = PA RTK,			

FOR MOBIL USE ONLY: (FILL NO: RR175A2*404) MHC: 1* 1* NA 1* 1* PPEC:
US83-100 APPROVE REVISED: 03/27/85

PREPARED BY: MOBIL OIL CORPORATION
ENVIRONMENTAL AFFAIRS AND TOXICOLOGY DEPARTMENT, PRINCETON, NJ
FOR FURTHER INFORMATION, CONTACT:
MOBIL OIL CORPORATION, PRODUCT FORMULATION AND QUALITY CONTROL
3225 GALLOWES ROAD, FAIRFAX, VA 22037 (703) 849-3265

INFORMATION GIVEN HEREIN IS OFFERED IN GOOD FAITH AS ACCURATE, BUT WITHOUT GUARANTEE. CONDITIONS OF USE AND SUITABILITY OF THE PRODUCT FOR PARTICULAR USES ARE BEYOND OUR CONTROL; ALL RISKS OF USE OF THE PRODUCT ARE THEREFORE ASSUMED BY THE USER AND WE EXPRESSLY DISCLAIM ALL WARRANTIES OF EVERY KIND AND NATURE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN RESPECT TO THE USE OR SUITABILITY OF THE PRODUCT. NOTHING IS INTENDED AS A RECOMMENDATION FOR USES WHICH INFRINGE VALID PATENTS OR AS EXTENDING LICENSE UNDER VALID PATENTS. APPROPRIATE WARNINGS AND SAFE HANDLING PROCEDURES SHOULD BE PROVIDED TO HANDLERS AND USERS.



80000 SERIES
10% P.C.W.

American Chemical Technologies, Inc.
46915 Liberty Drive Wixom, Michigan 48393
(248) 624-1550
FAX: (248) 624-2366

EMERGENCY: INFOTRAC 1-800-535-5053 24 HR/DAY, 7 DAYS/WEEK

THIS MSDS COMPLIES WITH 29 CFR 1910.1200 (THE HAZARD COMMUNICATION STANDARD)

=====

SECTION I - PRODUCT IDENTIFICATION

=====

PRODUCT NAME: FR WG 200-D
GENERIC ID: FIRE RETARDENT WATER GLYCOL HYDRAULIC FLUID
DOT HAZARD CLASSIFICATION: NOT APPLICABLE

=====

SECTION II - COMPONENTS

=====

CAS OR CHEMICAL NAME: DIETHYLENE GLYCOL
CAS NUMBER: 111-46-6
PERCENTAGE RATE: < 40%
HAZARDOUS PER 29 CFR 1910.1200: YES
EXPOSURE STANDARD: NONE ESTABLISHED

CAS OR CHEMICAL NAME: POLYALKYLENE GLYCOL
CAS NUMBER: 52624-57-4
PERCENTAGE RATE: < 13%
HAZARDOUS PER 29 CFR 1910.1200: YES
EXPOSURE STANDARD: NONE ESTABLISHED

CAS OR CHEMICAL NAME: DIPAE
CAS NUMBER: 96-80-0
PERCENTAGE RATE: <3%
HAZARDOUS PER 29 CFR 1910.1200: YES
EXPOSURE STANDARD: NONE ESTABLISHED

CAS OR CHEMICAL NAME: D/I WATER
CAS NUMBER: 7732-18-5
PERCENTAGE RATE: 35-45%
HAZARDOUS PER 20 CFR 1910.1200: NO
EXPOSURE STANDARDS: NONE ESTABLISHED

THIS PRODUCT CONTAINS NO INGREDIENTS LISTED AS CARCINOGENS BY NTP, IARC, OR OSHA.

THIS PRODUCT CONTAINS NO TOXIC CHEMICAL AT A LEVEL WHICH IS REPORTABLE UNDER SARA TITLE III, SECTION 313.

=====

SECTION III - PHYSICAL DATA

=====

BOILING POINT/MELTING POINT @ 760 mm Hg: 215 °F
VAPOR PRESSURE mm Hg @ 20 °C: NOT APPLICABLE
SPECIFIC GRAVITY OR BULK DENSITY: 9.05 lb/gal.
SOLUBILITY IN WATER: COMPLETE
pH: 9.6
POUR POINT: -53 °F
APPEARANCE: CLEAR, RED LIQUID
ODOR: GLYCOL TYPE
INTENSITY: SLIGHT

=====

SECTION IV - FIRE AND EXPLOSION INFORMATION

=====

FLASH POINT: NONE (*)
AUTOIGNITION TEMP: NONE (**)
FLAMMABILITY LIMITS IN AIR (% BY VOL): LOWER: N/A UPPER: N/A
EXTINGUISHING MEDIA: USE WATER FOG, FOAM OR CO2 EXTINGUISHING MEDIA.
FIREFIGHTING PROCEDURES: FIRE FIGHTERS SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND TURNOUT GEAR.

(* : AFTER WATER HAS BEEN COMPLETELY EVAPORATED, FLASH POINT IS 250°F).

(** : AFTER WATER HAS BEEN COMPLETELY EVAPORATED, AUTOIGNITION TEMPERATURE IS 775°F).

NFPA CODES: HEALTH - 1 FLAMMABILITY - 0 REACTIVITY - 0

=====

SECTION V - HEALTH HAZARD DATA

=====

EFFECTS OF OVEREXPOSURE:

THE PRIMARY ROUTES OF EXPOSURE TO THIS MATERIAL ARE EYE OR SKIN CONTACT, AND INHALATION. PROLONGED OR REPEATED SKIN OR EYE CONTACT MAY RESULT IN IRRITATION. VAPORS OR MISTS OF DIETHYLENE GLYCOL MAY BE IRRITATING TO THE RESPIRATORY TRACT. THE EFFECTS OF INGESTION INCLUDE NAUSEA, DIARRHEA, DIZZINESS, DROWSINESS, KIDNEY DAMAGE AND POSSIBLE COMA. CHRONIC OVEREXPOSURE TO DIETHYLENE GLYCOL MAY RESULT IN KIDNEY AND LIVER DAMAGE.

EXISTING MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE TO THIS MATERIAL: NO INFORMATION FOUND FOR THIS MIXTURE.

FIRST AID:

IF ON SKIN: WASH AFFECTED AREAS WITH SOAP AND WATER. REMOVE AND LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.
IF IRRITATION DEVELOPS, GET MEDICAL ATTENTION.

IF IN EYES: IMMEDIATELY RINSE EYES WITH RUNNING WATER FOR 15 MINUTES. IF IRRITATION DEVELOPS GET MEDICAL ATTENTION.

=====

SECTION V - HEALTH HAZARD DATA (CONTINUED)

=====

FIRST AID (CONTINUED):

INGESTION: IF SWALLOWED, DILUTE WITH WATER AND IMMEDIATELY INDUCE VOMITING. NEVER GIVE FLUIDS OR INDUCE VOMITING IF THE VICTIM IS UNCONSCIOUS OR HAVING CONVULSIONS. GET IMMEDIATE MEDICAL ATTENTION.

INHALATION: MOVE TO FRESH AIR. AID IN BREATHING, IF NECESSARY, AND GET MEDICAL ATTENTION.

TOXICOLOGICAL TEST DATA:

RAT, ORAL LD

RABBIT, SKIN IRRITATION

RABBIT, EYE IRRITATION

RESULT:

>5000 mg/kg

IRRITATING

IRRITATING

=====

SECTION VI - REACTIVITY DATA

STABILITY: STABLE

CONDITIONS TO AVOID: N/A

CHEMICAL INCOMPATIBILITY: N/A

HAZARDOUS DECOMPOSITION PRODUCTS: N/A

HAZARDOUS POLYMERIZATION: DOES NOT OCCUR

CONDITIONS TO AVOID: CORROSIVE TO TIN, LEAD, ZINC, MAGNESIUM,
AND CALCIUM.

OXIDIZER: NO

=====

SECTION VII - SPECIAL PROTECTION

=====

RESPIRATORY PROTECTION:

IF VAPORS OR MISTS ARE GENERATED, WEAR A NIOSH/MSHA APPROVED ORGANIC VAPOR/MIST RESPIRATOR.

EYE PROTECTION:

CHEMICAL GOGGLES; ALSO WEAR A FACE SHIELD IF SPLASHING HAZARD EXISTS.

PROTECTIVE CLOTHING:

GLOVES, COVERALLS, APRON, BOOTS AS NECESSARY TO PREVENT SKIN CONTACT

VENTILATION:

USE LOCAL EXHAUST TO CONTROL VAPORS/MISTS.

OTHER:

NOT APPLICABLE

=====

SECTION VIII - ENVIRONMENTAL DATA

=====

ENVIRONMENTAL TOXICITY DATA:

FISH TOXICITY: LC.: >1000 mg/l (FATHEAD MINNOW. 96 HR)

=====

SECTION VIII - ENVIRONMENTAL DATA (CONTINUED)

=====

SPILL AND LEAK PROCEDURES:

SPILL SHOULD BE CONTAINED, SOLIDIFIED, AND PLACED IN SUITABLE
CONTAINERS FOR DISPOSAL. THIS MATERIAL IS NOT REGULATED UNDER RCRA
OR CERCLA ("SUPERFUND")

HAZARDOUS SUBSTANCE SUPERFUND: NO

RQ (lbs):

WASTE DISPOSAL METHOD:

DO NOT DISCHARGE INTO WATERWAYS OR SEWER SYSTEMS. DISPOSE OF IN
ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.

=====

SECTION IX - SPECIAL PRECAUTIONS OR OTHER COMMENTS

=====

STORE IN A COOL DRY PLACE. KEEP CONTAINER CLOSED. AVOID PROLONGED
CONTACT WITH SKIN OR CLOTHING. AVOID EXTREME HEAT.

THIS PRODUCT DOES NOT CONTAIN OR MANUFACTURED WITH CLASS I OR
CLASS II OZONE-DEPLETING SUBSTANCES.

NAME OF PREPARER: AIDA B. MAXSAM

REVISION DATE: 11/06/98

SUPERSEDES: 07/01/98

A.C.T., INC. BELIEVES THE DATA SET FORTH HEREIN ARE ACCURATE AS
OF THE DATA HEREOF. WE MAKE NO WARRANTY WITH RESPECT THERE TO AND
EXPRESSLY DISCLAIMS ALL LIABILITY FOR RELIANCE THEREON. SUCH DATA
ARE OFFERED SOLELY FOR YOUR CONSIDERATION, INVESTIGATION AND
VERIFICATION.

80000 SERIES
10% P.C.W.
RECYCLED

Material Safety Data Sheet

Chempet 6512 Cleaner

QUICK IDENTIFIER

Common Name: (used on label and list)

May be used to comply with OSHA's Hazard Communication Standard, 29CFR 1910.1200. Standard must be consulted for specific requirements.

SECTION 1 -

Manufacturer's Name Chempet Corp.

Address 1750 Armitage Ct.

City, State, and ZIP Addison, IL 60101

Emergency Telephone No. (312) 495-4540

Other Information Calls

Signature of Person Responsible for Preparation (Optional)

Date Prepared 2/89

SECTION 2 - HAZARDOUS INGREDIENTS/IDENTITY

Hazardous Component(s) (chemical & common name(s))	OSHA PEL	ACGIH TLV 3 mg/m ³	Other Exposure Limits	% (optional)	CAS NO.
Potassium hydroxide; 45%		C2	2.5		1310-58-3

SECTION 3 - PHYSICAL & CHEMICAL CHARACTERISTICS

Boiling Point	212	Specific Gravity (H ₂ O=1)	1.16	Vapor Pressure (mm Hg)	N/A
		Vapor Density (Air = 1)	N/A		
Solubility in Water	Complete	Reactivity in Water	N/A		
Appearance and Odor	Straw yellow liquid/ mild odor	Melting Point	N.A.		

SECTION 4 - FIRE & EXPLOSION DATA

Flash Point	N/A	C.	Method Used	N/A	Flammable Limits in Air % by Volume	LEL Lower	UEL Upper	N/A
Auto-Ignition Temperature	N/A		Extinguisher Media	None required				
Special Fire Fighting Procedures	None							

Unusual Fire and Explosion Hazards None

SECTION 5- PHYSICAL HAZARDS (REACTIVITY DATA)

Stability Unstable ☐ Conditions
Stable ☒ to Avoid N/A

Incompatibility
(Materials to Avoid) None

Hazardous
Decomposition Products None

Hazardous May Occur ☐ Conditions
Polymerization Will Not Occur ☒ to Avoid N/A

SECTION 6 - HEALTH HAZARDS

1. Acute Eye contact 2. Chronic Skin irritation

Signs and
Symptoms of Exposure Burning of eyes, skin irritation

Medical Conditions Generally
Aggravated by Exposure Dermatitis of skin - reddening of eyes

Chemical Listed as Carcinogen National Toxicology Yes ☐
or Potential Carcinogen Program No ☒ I.A.R.C. Yes ☐
Monographs No ☒ OSHA Yes ☐
No ☒

Emergency and
First Aid Procedures See below.

ROUTES
OF
ENTRY

1. Inhalation N/A
2. Eyes Flush with copious amounts of cool water
3. Skin Wash with water
4. Ingestion Drink dilute vinegar or fruit juice. Consult a physician

SECTION 7 - SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be Taken
in Handling and Storage Store in cool, dry area. Keep container closed when not in use.

Other
Precautions Keep from freezing

Steps to be Taken in Case
Material is Released or Spilled Mop up excess. Wash down area with water.

Waste Disposal
Methods (Consult federal, state, and local regulations) In accordance to federal, state, & local regulation

SECTION 8 - SPECIAL PROTECTION INFORMATION/CONTROL MEASURES

Respiratory Protection
(Specify Type) N/A

Ventilation Local Exhaust ☒ Mechanical (General) Special Other

Protective
Gloves Rubber or chemical resistant Eye
Protection Safety glasses or goggles

Other Protective
Clothing or Equipment None

Work/Hygienic Practices Normal good work & housekeeping practices.

IMPORTANT

Do not leave any blank spaces. If required information is unavailable, unknown, or does not apply, so indicate.

QUAN-PAX
RECYCLED
80000 SERIES
10% P.C.W.